RESTRICTED

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL DEVELOPMENT ASSOCIATION

APPRAISAL OF THE

AGRICULTURAL CREDIT PROJECT

KOREA

May 2, 1972

Agriculture Projects Department

CURRENCY EQUIVALENTS

US$1	=	W 370
Won 1	=	US$0.0027
Won 1 million	=	US$2,700

WEIGHTS AND MEASURES

1 Metric ton	=	2,204 lbs
1 Kilometer	=	0.621 Mile
1 Ha	=	2.47 Acres
1 Ha	=	1.01 Chongbo
1 Ha	=	3,024 Pyongs
1 Pyong	=	3.31 Square Meters

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

ADC	=	Agricultural Development Corporation
AFDC	=	Agricultural and Fishery Development Corporation
BOK	=	Bank of Korea
EPB	=	Economic Planning Board
MAF	=	Ministry of Agriculture and Forestry
MOF	=	Ministry of Finance
NACF	=	National Agricultural Cooperative Federation
ORD	=	Office of Rural Development
ROK	=	Republic of Korea

FISCAL YEAR

January 1 - December 31

KOREA

AGRICULTURAL CREDIT PROJECT

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KOREA

AGRICULTURAL CREDIT PROJECT

SUMMARY AND CONCLUSIONS

i. This report appraises an Agricultural Credit Project for which an IDA credit of $10.5 million is proposed. It will support a three-year lending program for financing investments on about 12,000 farms under four major categories: orchards, sericulture, mushroom, and poultry and swine. Agriculture in Korea, which in 1968-70 contributed 28% of GNP and 26% of exports and employed nearly half of the labor force, has been increasing at a fair rate of slightly less than 4% per annum, but lagging significantly behind the remarkable growth (10%) of the economy. The country's Third Plan (1972-76), therefore, seeks to raise agricultural output at the rate of 4.5% and achieve a more balanced growth between agriculture and other economic sectors. The proposed Project would assist in meeting these goals by generating about 6,000 jobs and by raising the income of participating farmers. Increasing production of fruit, pork, poultry meat, and eggs would meet the needs of urban consumers while support to mushroom and sericulture would help expand exports. The agricultural program, previously dominated by rice, would thus be better balanced.

ii. Korean farmers are skilled, industrious, receptive to new technology, market-responsive and eager to invest. They have experience in the technical requirements of the activities to be financed under the Project and, as members of the National Agricultural Cooperative Federation (NACF), they benefit from its input supply, credit and marketing services, and Government's extension service. These support services would improve under the Project with the help of experts to assist the proposed technical unit and to train loan officers.

iii. This would be the first agricultural credit project to be financed in Korea by the Bank Group. Three previous operations in the agricultural sector involved two irrigation projects and a dairy-beef project.

iv. The IDA credit would finance US$10.5 million, or 58% of total project cost, including $7.4 million of local cost. The estimated Project cost is US$18.2 million equivalent, with a foreign exchange component of US$3.1 million. Labor and local materials constitute a large proportion of the investment cost. Government/NACF would contribute US$4.2 million equivalent, or 23% of Project cost, while the balance of about 19% would come from resources of the sub-borrowers. Of the Project cost, 38% would be for orchards, 32% for sericulture, 11% for mushroom, and 15% for poultry and swine. The balance of 4% would be for training facilities and technical services. The period of loan to sub-borrowers would vary from five years in the case of poultry and swine to 12 years for apples. Government's contribution to Project cost, together with the proceeds of the IDA credit, would be transferred to NACF as a loan for not less than 15 years, carrying interest at 7% and set up as a special fund in the NACF. Government would decide, in consultation with IDA, whether the resources of this special fund would be retained as a long-term loan or provided to NACF in any other form after the

proposed study of NACF by management consultants. NACF would pass on the funds at 9% to the Kun (county) cooperatives, which, in turn, would charge 12% on the loans to the farmers.

v. The NACF is the apex organization of agricultural cooperatives in Korea at the national level. It would finance sub-borrowers through selected Kun cooperatives that are its members and operate at the county level. The working of NACF is complicated by the fact that it helps implement Government policies by undertaking supply, marketing, and other functions in addition to credit. Some of these activities are subsidized. Though deposit mobilization by cooperatives has been significant, the capital base of NACF is weak in relation to its expanding operations, and its profits have been meager. Under the Project, its financial position would be strengthened by the provision of Government funds in the form of a long-term loan, and its efficiency in regard to loan appraisal and supervision would be improved through technical assistance. Its organization and accounting system would also be studied by management consultants as a preliminary step to reorganization and improvement of cost accounting and management information.

vi. The range of items to be financed under the Project for on-farm investment is varied and would not be suitable for international competitive bidding. Farmers would purchase supplies and implements of their own choice through existing cooperative or private commercial channels. The construction of buildings costing US$75,000 (mostly for NACF's training facilities), would be subject to local competitive bidding. Power tillers, though part of the Project, would not be financed by IDA credit.

vii. Estimated financial rates of return range from 18% to 58% for the various sub-projects. The estimated overall economic rate of return is about 37%. The Project would be suitable for an IDA credit of US$10.5 million on IDA's usual terms.

KOREA

AGRICULTURAL CREDIT PROJECT

I. INTRODUCTION

1.01 The Republic of Korea's request for an IDA credit is the result of efforts by Government, with Bank Group assistance, to develop an agricultural credit project suitable for Bank Group financing. Two FAO/IBRD Cooperative Program missions, one in February/March 1969 and another in May/June 1970, and an IBRD mission in March 1971, visited Korea to assist the National Agricultural Cooperative Federation (NACF) in preparing its application. The Project is designed to help diversify Korean agriculture and to strengthen cooperative credit and other farmer services.

1.02 The Bank Group has made three loan/credits to Korea for agricultural development: US$45 million (Loan 600-KO) in 1969 for the Pyongtack - Kumgang irrigation project; US$7 million (Credit 234-KO) in 1971 for an integrated dairy-beef project; and US$15 million (Credit 283-KO) and US$33 million (Loan 795-KO) in 1972 for the Yong San Gang Irrigation Project.

1.03 This report is based on the findings of an appraisal mission to Korea in June/July 1971, consisting of Messrs. von Oppenfeld, Merghoub, Ramasubbu and Rossi (IDA).

II. BACKGROUND

A. General

2.01 The Republic of Korea comprises 98,000 km^2, covering the southern half of a peninsula located between the East Sea and the Yellow Sea (Map 1). It has a population of 31.8 million and had an average annual growth rate of 2.3% over the period 1965-70, down from 2.9% in the early 1960's. The rural population that derives its livelihoood from agriculture was less than 50% of total population in 1970. Korea has had an effective land reform. Maximum farm size is 3 ha, except for orchards, pasture, and range land. However, fragmentation is a problem from the standpoint of modernization efforts.

2.02 Annual growth in GNP has averaged 9.6%, (1960-69) in real terms, but has not been equally distributed, expansion in manufacturing being substantially in excess of this figure, while agricultural growth averaged slightly below 4%. Agriculture, fisheries, and forestry accounted for about 28% of GNP and contributed an average of 26% of total merchandise exports in 1970. Real income per farm household increased by 45% in the 1965-69 period, while real farm wages rose 50% between 1965 and 1970. Per capita income was about US$225 equivalent in 1970. Prices have been rising at an annual rate of 8% to 10% in recent years.

2.03 To achieve stability in the balance of payments and domestic prices, some slow-down in the rate of economic expansion would be required. Moreover, considerable efforts are needed to promote exports and import substitution, both in industry and agriculture. A major economic problem is the mobilization of sufficient resources. Agricultural imports increased more sharply than agricultural exports, exceeding exports by US$220 million in 1970 (Annex 1, Table 2). The Third Plan projects that agricultural output will rise at the rate of 4.5% and that exports will increase sharply. Production of rice, the most important staple crop, is to go up by about 1 million m tons, or 25%, in line with Korea's aim of achieving self-sufficiency in rice.

B. Agricultural Sector

2.04 About one-fourth of Korea's total land area is cultivated (2.5 million ha). Average farm size is about 0.9 ha. Irrigation (about 1 million ha) and mild winters in the country's southern part permit an increased land use intensity through double-cropping (about 3.6 million ha is cropped). Most of the intensively farmed land is alluvial and lies along the river basins, valleys and coastal margins, although piedmonts and high uplands have good development potential. Annual rainfall ranges from 800 to 1,600 mm. Further details on physical resources and development potential are in Annex 1.

2.05 Rice is the major crop, occupying about 1.2 million ha. Output grew at slightly less than 2% during the 1960's, averaging about 4 million m tons in 1968 and 1970. Barley follows rice in importance and its output is around 2 million m tons. Minor staple crops are wheat and soybean. Output of fruits, vegetables and livestock products expanded significantly during the 1960's due to increasing consumer demand in domestic urban markets, while production of silk and mushroom grew in response to rising export demand. Although some 40% of Korean farmers keep cattle, 39% hogs and 47% poultry, the numbers per farm are small, running, on average, no more than one cow or pig per household and less than 10 chickens. As the orientation of these livestock industries is shifting from home consumption to commercial markets these numbers will gradually increase.

2.06 A comprehensive policy towards agriculture has slowly emerged. Its principal aim has been to increase food grain production, especially rice and, equally important but on a smaller scale, industrial crops like mushroom, mulberry for sericulture, and tobacco. Dairy-beef cattle (Credit 234-KO) and other livestock development has been encouraged to attain a more balanced system of mixed farming (para 2.14).

2.07 To achieve these goals, Government has developed irrigation (about 100,000 ha since 1965), made fertilizer and lime available at subsidized cost (consumption increased from 279,000 m tons in 1960 to 563,000 m tons in 1970), established a nationwide extension system, and expanded credit services (loans outstanding rose from W 24,000 million in 1966 to W 105,000 million in 1970). For satisfactory provision of extension, credit and farm

supplies, Government has taken steps to strengthen the countrywide network of agricultural cooperatives under the National Agricultural Cooperative Federation (para 2.15, Annexes 2 and 3, and Map 2).

2.08 Although the agricultural growth rate (slightly less than 4%) did not match the remarkable industrial growth (20% during the 1960's), it was substantially in excess of population increase (para 2.01). However, rising income and consumption have led to a trade deficit in agricultural products. Major goals of the Third Plan are to expand agricultural production and raise rural living levels. To help achieve them, Government has allocated a total of W 470 billion, one-quarter of total public expenditure, for investment in agriculture, fisheries, and forestry. Efforts initiated under the Second Plan are to be intensified and supplemented by seed improvement and farm mechanization. Implementation of the ambitious development program will require considerable efforts and resources on the part of Government.

2.09 A second objective of the new Plan is to continue crop diversification to expand agricultural exports (especially silk and mushroom) and increase production of nutritionally superior foods (fruit and livestock products) to satisfy the rapidly increasing domestic demand. The Plan aims at high rates of annual growth--corn, 14%; pork, 11%; eggs, 8%; and cocoon, 14%. The proposed Project would encourage poultry, swine and fruit production to satisfy domestic demand and would improve cocoon and mushroom production to help achieve export targets.

2.10 Korean farmers are literate, industrious and improvement-minded and can be expected to respond to appropriate incentives and to provide, in the long run, the leadership required for a vigorous rural cooperative system. The adequacy of support services and effectiveness of production incentives, on the other hand, depend to a large extent on the institutional strength of NACF. Over recent years, the scope and scale of NACF's responsibilities have grown substantially as it expanded its activities in credit, input distribution and marketing. Under the Third Plan, these activities will grow even more, which means that NACF will have to increase and improve its organization if it is to play an effective role. A study of NACF by management consultants is, therefore, proposed under the Project, as a first step towards enabling NACF to reorganize and improve its services (para 4.21).

Orchards

2.11 Fruit orchards (mainly apples, grapes, peaches, and pears) accounted for about 2% of Korea's cultivated area in 1969, generating an output of about 420,000 m tons (Annex 8). Production, in fresh or processed form, is mainly for the domestic market, with export to neighboring countries not yet significant. Domestic consumption of such commodities is increasing and prices have been rising more rapidly than those of other farm products, reflecting the rapid growth of the urban population coupled with rising per capita income (Annex 8, Table 1). Orchard areas have increased by 30% during the last five years, indicating spontaneous growth, and, although about 40% are estimated to be still non-bearing, output has grown by 34%.

Sericulture

2.12 Traditionally a household industry, sericulture is emerging as an export-oriented commercial farm enterprise. On a small scale, silkworms are reared in farm houses but this is unsatisfactory, partly because of poor sanitation and quality control and partly because of insufficient space. About 500,000 families, or 19% of rural households, are engaged in the industry. Area in mulberry trees and raw silk exports have increased four times from 1962 levels. Further significant increases will require new specialized farm structures for silkworm rearing. Further details are in Annex 9.

Mushroom

2.13 The growth of Korean mushroom production and exports masks many failures of small, independent mushroom farms. Experience has shown that production units must be large enough to afford the level of management and capital input needed to enable them to control the environmental factors (properly composted soil, fertility, humidity, and phyto-sanitary conditions) necessary for mushroom growing. The increase in annual production from 100 m tons in 1965 to 6,000 m tons in 1970 has mainly come from such commercial units. To ensure regular and increasing supplies, mushroom canners have themselves invested in mushroom growing facilities, either alone or in joint ventures. Further details are at Annex 10.

Poultry and Swine

2.14 The demand for high protein food in Korea's urban markets is strong and rapidly expanding (Annex 11, Table 1). Government, with IDA (Credit 234-KO) and bilateral assistance, is promoting dairy and beef development but incremental production is subject to long gestation periods. Poultry and pork production, however, can be increased in a relatively short time. Chicken population and egg production, in fact, more than doubled between 1965 and 1970, mainly because of the strong market and the availability of appropriate technology. Swine production has not yet increased significantly although many farmers are engaged in it on a small scale. Though feed ingredients, especially maize, are imported, the domestic feed industry is growing. Technicians and salesmen of Korean hatcheries and feed mills, some trained with parent companies abroad, play an important role in disseminating technical and managerial information to poultry and swine producers.

C. Agricultural Services

Organizational Support

2.15 The agricultural cooperative structure of Korea consists of the NACF at the national level, 140 cooperatives at the county level (Kun cooperatives), and 6,714 cooperatives at the village level (Ri Dong cooperatives). This network, which covers, through its membership, about 93% of the estimated 2.6 million farm households in Korea and is multipurpose in its functions, is

the major instrument through which the Government implements its agricultural policies. Government and NACF have been actively implementing a program to reorganize the village cooperatives to form viable units. As a result, their number has dropped from about 16,000 in 1968 to 6,714 in 1970, and is expected to go down to 1,500 by the end of 1972. Through this system, NACF distributes farm inputs; markets agricultural produce; conducts training for employees and leaders of the cooperatives; and operates a guidance (extension) service, especially for cooperative management.

2.16 The main Government and semi-Government agencies supporting agriculture (besides NACF) are: the Ministry of Agriculture, Forestry and Fisheries (MAF), the Agricultural Development Corporation (ADC), and the Agriculture and Fisheries Development Corporation (AFDC).

2.17 The MAF formulates agricultural policy and its Office of Rural Development (ORD) conducts research and advises farmers through a nationwide extension service. ORD is especially active in a seed-improvement program and maintains and improves quality standards of agricultural commodities.

2.18 The ADC, a semi-autonomous agency with ultimate responsibility to the Minister of Agriculture, directs water resource development, land consolidation and reclamation, and agricultural mechanization. The AFDC, a Government-owned financial corporation, encourages processing and marketing of agriculture, forest, and fish products by providing equity and loan capital.

Agricultural Credit

2.19 The banking system of Korea consists of six commercial banks, which operate branches throughout the country; seven local banks with smaller jurisdictions; branches of six foreign banks; and seven specialized banks, the NACF being the most significant in relation to agricultural credit. The Bank of Korea, as the central bank, exercises powers of credit control and supervision and provides rediscount facilities. The only non-bank financial institution relevant to agriculture is the AFDC (para 2.18).

2.20 Of 1,432 bank branches in Korea, 751 belong to NACF and other cooperatives which are the major institutional source for agricultural credit (Annex 2). Non-institutional lending, however, is more important: according to a farm household survey, 68% of the average borrowings per cultivator household at the end of 1969 was supplied by individuals (other farmers, relatives and friends), 21% by cooperatives and other public bodies, and 11% by others, including commercial banks.

2.21 Interest rates charged by private moneylenders have been excessive, reportedly going up to 50 to 60% per annum in some instances, despite some decline under the impact of expanding cooperative credit. In the institutional sector itself, interest rates on deposits (10 to 21%) and loans (22 to 24%) have generally been maintained at relatively high levels since 1965 as part of a monetary policy designed to check inflation (para 2.02)

and promote savings. Lower lending rates were permitted, however, for priority sectors such as exports (6%) and agriculture (9 to 15%), supported by low cost funds from Government and the Central Bank.

III. THE PROJECT

A. Definition

3.01 The Project, which would be part of NACF's lending program, would help finance, over three years, medium- and long-term investments on farms typically ranging from 1 to 3 ha. Investments would be for a mix of farm enterprises under four categories: orchards (38%); sericulture (32%); mushroom (11%); and poultry and swine (15%). The balance (4%) of Project cost would be for technical services and training facilities. Project loans would usefully complement and supplement on-going Government programs for irrigation, drainage and watershed development, land improvement and consolidation and increased availability of high-grade inputs, especially seeds and planting materials. They would also enable participating farmers to adopt modern technology.

3.02 Illustrative farm size, phasing of loans, average investment per farm, and total investment cost for each sub-project are shown below:

	Illustrative Size of Farm Business Unit		Projected Phasing of Loans				- Investment Cost -	
			Year				Average	Total, each
			1	2	3	Total	per farm	Sub-project
	At Present	With Project	(Number)				(W'000)	(W million)
Orchards								
Apples, ha	1.0	2.0	200	300	300	800	1,205	964
Grapes, ha	0.3	1.5	150	200	250	600	1,104	662
Peaches, ha	0.5	2.0	150	200	250	600	666	400
Pears, ha	1.0	2.0	150	170	180	500	1,036	518
Sericulture								
Mulberry Plantation, ha	0.2	0.4	2,000	3,000	4,000	9,000	243	2,187
Mushroom								
Growing Area, ha		0.7	6	7	7	20	36,424	729
Poultry and Swine								
Layers No.		2,000	70	100	130	300	1,886	566
Broilers, No.		4,000	50	70	80	200	1,924	385
Hogs, No.	15	50	60	90	100	250	285	71
Total			2,836	4,137	5,297	12,270		6,482

3.03 NACF would administer the Project, which would involve about 12,000 participating farmers. Sub-loans would be made by NACF on the basis of farm development plans, prepared by the farmer assisted by Kun (county) cooperative loan officers. These officers would also appraise loan requests and supervise their implementation.

B. Detailed Features

Orchards

3.04 The Project would finance development expenditures for apple, grape, peach (including other stone fruit) and pear orchards. Detailed estimates of investment and operating costs are set out under four illustrative farm models (Appendixes 8-1 to 8-4). Major investment categories would be for land clearing, terracing and preparation; orchard establishment, including improved planting materials, fertilizer and hired labor; power sprayers and tillers; water supply; and on-farm storage or handling facilities. Small equipment and storage facilities would normally be acquired by individual farmers. Where appropriate, NACF intends to encourage full use of modern equipment and facilities through loans to associations of farmers.

3.05 Although sub-loans would be made to about 2,500 fruit farmers in seven out of nine provinces, there would be a marked concentration within the fruit growing counties of these provinces, involving only 14 out of NACF's 140 Kun cooperatives (para. 2.15). This would facilitate effective orchard loan appraisal and supervision through specially trained loan officers of selected Kun cooperatives. This concentration would also be advantageous for fruit marketing since, in addition to being members of Kun cooperatives, farmers are active in specialized horticultural ccoperatives that organize auction sales and bulk shipments to terminal markets and, in certain cases, operate storage and processing facilities.

Sericulture

3.06 Sub-loans under the sericulture component would help increase the productivity (through improved planting materials and new hybrid silkworms) and replant and expand the mulberry plantations from the present average size of less than 0.2 ha to about 0.4 ha. Replanting is important because the yield of mulberry leaf (the silkworm's feed) declines sharply when bushes are older than 14 years (Annex 9) and there are many old plantations. Sub-loans would also cover expenditures for silkworm rearing houses, including ancillary facilities and implements (Appendix 9-1). Specially designed, though inexpensive, rearing houses would permit environmental control, which determines quantity and quality of output (cocoons). Investments would be concentrated in regions covered by 25 of NACF's Kun cooperatives, involving about 9,000 farmers. Because detailed appraisal of

each sub-loan, based on a visit to each farm, would not be possible, sub-borrowers would be selected by the Kun cooperative's loan appraiser in close cooperation with the local extension officer and the processing (silk reeling) plant.

Mushroom

3.07 High mushroom yields in Korea cannot be obtained without modern inputs, buildings, and equipment. Major investment categories for this component (detailed in model 3, Appendix 10-1) are buildings, growing beds and associated facilities, heating and water systems, and small equipment. The mushroom houses would be located close to existing canning plants. The typical sub-borrower would either be a mushroom canner or one or more owners of several sub-units in joint venture with a mushroom canner. Assurances were obtained during negotiations that, unless otherwise agreed with IDA, sub-loans (except those for units wholly owned by canners) would require at least 20% participation by the canner in the investment for growing facilities and a management contract, satisfactory to NACF, between the grower(s) and the canner. These measures would enable NACF to encourage growers to participate in ownership and management by providing for financing of several sub-units within composite mushroom houses and ensure proper management of mushroom raising (para 2.13).

Poultry and Swine

3.08 The Project would encourage investments for poultry and swine under three sub-projects: (a) broiler; (b) egg; and (c) pork production. Major investment categories, as detailed in three farm models (Appendixes 11-1 to 11-3), would be buildings, tools and implements and feeding and watering facilities. Typical new production units for laying hens would have a capacity of 2,000, while those for broilers would be able to house 4,000 (a turnover of three to four times a year is planned). Brooder houses would also be built for rearing chicks. Existing facilities for pork production would be expanded to increase capacity from 15 weaner pigs to 50. Sub-loans would be concentrated in 19 of NACF's 140 Kun cooperatives, in the vicinity of the important urban markets (Map 2). About 750 farmers would be involved as sub-borrowers.

Technical Services

3.09 The Project would provide for the services of a senior farm management expert to advise NACF on appraisal and supervision of loans, organize and conduct training courses for the loan officers of NACF and Kun cooperatives, and follow up these efforts in the field. His services would be required for at least two years. Additionally, provision has been made for a mushroom consultant to be employed for about three months to assist NACF staff in technical aspects of building design and other operating matters. A study of NACF's accounting system and organization by a firm of management consultants is also provided for.

Training Facilities

3.10 The credit would help improve and expand NACF training facilities and technical services (para 4.15) required for Project operations and related

essential services. Works would consist of expanded accommodation and library facilities for the trainees, including appropriate equipment. NACF has detailed plans and cost estimates to cover these improvements.

C. Cost Estimates and Financing

Cost Estimates

3.11 Total Project cost is estimated at W 6.7 billion (US$18.2 million), of which 17%, or W 1.1 billion, would be foreign exchange. Locally provided materials and labor account for 83% of Project costs. Estimates are based on constant prices as of July 1971 and include an allowance of about 15% for price increases. Cost estimates, including foreign exchange requirements, are:

	Local	Foreign	Total	Local	Foreign	Total	Foreign Exchange
	(W Million)			(US$ '000)			%
Orchards							
Apples	810	154	964	2,189	416	2,605	16
Grapes	563	99	662	1,521	268	1,789	15
Peaches	336	64	400	909	172	1,081	16
Pears	435	83	518	1,176	224	1,400	16
Sericulture	1,881	306	2,187	5,084	827	5,911	14
Mushroom	620	109	729	1,675	295	1,970	15
Poultry and Swine							
Eggs	453	113	566	1,224	306	1,530	20
Broilers	320	65	385	865	176	1,041	17
Hogs	60	11	71	162	30	192	16
Sub-total	5,478	1,004	6,482	14,805	2,714	17,519	15
Technical Services							
Expert Services	2	28	30	6	75	81	93
Management Consultants	29	78	107	79	210	289	73
Training Facilities	89	22	111	241	59	300	20
Total Project Cost	5,598	1,132	6,730	15,131	3,058	18,189	17

The following investment items would be involved:

	Fruit	Seri-culture	Mushrooms	Poultry & Swine	Training Facilities and Technical Services	Total
	(W Million)					
Buildings	747	900	540	595	91	2,873
Water Heating and Power Systems	7	-	107	18	9	141
Fertilizer, Pesticides Lime, Manure and Planting Materials	328	221	-	-	-	549
Power Tillers	225	162	-	-	-	387
Miscellaneous Small Implements, Tools and Fittings for Buildings	478	657	4	276	10	1,425
Establishment Costs, Including Hired Labor and Services	439	180	-	-	135	754
Contingencies	320	67	78	133	3	601
Total	2,544	2,187	729	1,022	248	6,730

Financing

3.12 The IDA credit would finance US$10.5 million, or about 58% of total Project cost (US$18.2 million). This would include US$7.4 million equivalent of local cost financing. Government/NACF would contribute US$4.2 million equivalent, or 23% of Project cost. The remaining US$3.5 million equivalent would come from the sub-borrowers' own resources and would cover about 20% of their investment cost. Financing of various Project components would be as follows:

	Farmers	Government NACF	IDA	Total Project Cost	% Foreign Exchange
			(W Million)		
Orchards	509	628	1,407	2,544	16
Sericulture	437	520	1,230	2,187	14
Mushroom	146	142	441	729	15
Poultry and Swine	204	197	621	1,022	18
Sub-total	1,296	1,487	3,699	6,482	15
Farm Management & Mushroom Experts	-	2	28	30	93
Management Consultants	-	29	78	107	73
Training Facilities	-	31	80	111	20
Total in W Million:	1,296	1,549	3,885	6,730	17
Total in US$ '000:	3,503	4,186	10,500	18,189	
Per cent:	(19)	(23)	(58)	(100)	

3.13 Government would be the borrower, obtain the credit on IDA terms, and carry the exchange risk. It would transfer the proceeds of the IDA credit to NACF in the form of a loan, bearing interest at 7% and a maturity of no less than 15 years, which would be set up as a special fund (para 4.09).

D. Procurement and Disbursement

Procurement

3.14 The range of items financed is varied and would not be suitable for international competitive bidding. Buildings represent the most important investment category. Investments per farm would range from US$140 on peach farms to about US$73,000 equivalent for mushroom growing houses. On-farm storage, silkworm rearing sheds, poultry and swine houses would be constructed by the farmers themselves or by local artisans. On the other hand, all buildings costing more than US$75,000 each (mostly library and training facilities) would be procured through local competitive bidding. These buildings would not be of interest to foreign firms because of the different types involved and their scattered location. Miscellaneous small implements, tools and fittings for buildings represent the second largest category. Typical items would include sprayers, dusters and pumps for orchards, silk worm incubators, rearing shelves, nets and boxes for sericulture, feeders and waterers for swine and poultry farms. This variety of items would be procured in small amounts through normal cooperative and commercial channels which are well developed and readily accessible. The supply of these items is adequate. Power tillers which

represent only 6% of the Project cost are produced by three domestic firms. Imports being restricted, farmers' choice is limited to these makes and models and parts not locally produced are subject to an import duty and tax together amounting to 100%. As IDA requirements of free competition are not met, such purchases are not eligible for financing under the credit. As in the past, the power tillers in the project will be financed by Government from its Agricultural Mechanization Fund.

Disbursement

3.15 IDA's disbursement would take about four years from the date of effectiveness (Annex 12). Disbursements would be made against appropriate statements and documents for 75% of payments against (a) Project loans made by NACF (US$10.0 million) and (b) training facilities (US$215,000), and 100% of foreign expenditures for (a) services of farm management expert and mushroom consultant (US$75,000), and (b) management consultant services (US$210,000). If the amounts allocated to any category would no longer be required, they would be re-allocated to another category.

E. Project Administration

3.16 NACF would administer the Project. It would establish a technical unit, headed by a Project Manager who would be assisted by an internationally recruited farm management expert. The Project Manager would report directly to the Vice-President in charge of credit. The technical unit would be responsible for formulating criteria for loan appraisal; for training and supervising the regular appraisal staff, both at NACF headquarters and at the Kun level; for adopting these criteria and procedures for Project operations; and, generally, for monitoring the Project in all its aspects. Aside from administrative assistants, the technical unit would initially include at least one technician each for sericulture, livestock, horticulture, and farm management. To minimize duplication of existing staff and services and to ensure coordination within NACF, the Project Manager would be authorized to enlist the cooperation of technicians in NACF's livestock and farm management and marketing departments. To ensure overall coordination between NACF and other agencies involved in the Project, an assurance was obtained at negotiations that a Project Coordinating Committee would be appointed as indicated in the guidelines set out in Annex 4.

IV. THE NATIONAL AGRICULTURAL COOPERATIVE FEDERATION

General

4.01 NACF, established in 1961, is the apex organization of the agricultural cooperative structure in Korea. Its membership consists of 140 Kun cooperatives and 154 special cooperatives of orchard growers and livestock farmers. Aware of the problems arising from the rapid expansion of its operations, NACF has taken some steps to deal with them, but efforts are still inadequate and have to be accelerated.

Kun Cooperatives

4.02 The 140 Kun cooperatives, with about 400 branches, constitute the key tier of the cooperative structure. NACF and Kun cooperatives are distinct legal and financial entities but are closely integrated in regard to administration, management, resource mobilization, and lending operations. For presentation of data on deposits and loans, however, NACF and Kun cooperatives are treated in this appraisal as a single entity. The President of NACF appoints the presidents of Kun cooperatives and NACF shares its personnel with them, recruits part of their staff, instructs them on policies and procedures, and provides them with subsidies. Project loans would be routed through Kun cooperatives that meet specified criteria (Annex 5).

Resources

4.03 The resources of NACF and Kun cooperatives as of the end of 1970 amounted to about W 225 billion, including share capital and reserves amounting to W 7 billion, borrowings from Government (W 57 billion), borrowings from Bank of Korea (W 33 billion) and deposits (W 95 billion). Deposits, which were over W 100 billion at appraisal, exceeded twice their 1968 level and, of these, more than a fifth came from farmers. Borrowings from Government and the Bank of Korea were at concessionary interest rates and included fertilizer financing.

Use of Resources

4.04 The broad distribution of the use of the resources of NACF and Kun cooperatives as of the end of 1970 was as follows:

	(W billion)
Supply and Marketing	50
Insurance	6
Credit	129
Fixed Assets	10
Miscellaneous	30
Total	225

(a) Supplies: Sales of fertilizer (on a monopoly basis), farm chemicals, and agricultural machinery are at subsidized prices and partly on credit. Operations are financed mainly from a Bank of Korea credit and budgetary funds. Fertilizer business is affected by slow payments by Government and high inventory levels.

(b) Marketing: NACF markets some cash crops and other farm produce through auction at certain centers and by direct sales to the armed forces. It also purchases produce on Government account.

(c) Insurance: Insurance business - which includes life, livestock, fire, and education - is financed from premia and other receipts.

(d) Miscellaneous: NACF provides some facilities for transportation and storage of agricultural produce, for cooperative education and training, and for agricultural extension.

Lending Operations

4.05 NACF makes loans for agricultural and non-agricultural operations to individuals, cooperatives, and agricultural associations. Borrowings from Government and the Bank of Korea mainly help finance agricultural loans while other loans are made from deposit resources. Loans advanced by NACF and Kun cooperatives grew from W 32 billion in 1965 to W 185 billion in 1970 and outstanding loans from W 21 billion to W 105 billion. The proportion of loans advanced for non-agricultural purposes such as housing increased from 38% in 1966 to 54% in 1970.

4.06 Most short-term loans for agricultural production carry an interest rate of 15%. Medium-term loans are made for cash crops, sericulture, and livestock, and for relief in case of disaster. These loans are usually advanced for five years and carry interest at 9%. NACF also provides seasonal loans for working capital to some cooperatives and associations at a rate of 22%. The same rate applies to commercial credit, which includes financing of commercial farmers and urban commercial ventures and loans against fixed deposits. Export credit (for mushroom and silk cocoons) is, however, charged only 6%. Long-term loans for 35 years are made to irrigation associations at 3.5%.

Operating Results

4.07 Although NACF's overall operating results can be considered satisfactory, it is difficult to evaluate the success of each of its activities. This is partly due to the fact that some of these are service functions such as guidance on which no income is earned. Further, some of the operations are subsidized by Government. A preliminary analysis by NACF shows that credit, insurance and fertilizer operated at a profit in 1970, while marketing and purchasing activities lost.

Financial Position

4.08 NACF's paid-in capital and reserves amounted to only W 2,600 million as of the end of 1970, compared with short-term and long-term liabilities of W 115 billion, which included borrowings from Government of about W 50 billion. This situation has resulted from poor profits, the absence of any link between borrowing by its members and their shareholding, and the rapid increase in its operations. However, apart from making significant progress in deposit mobilization, NACF and affiliated cooperatives have been engaged in a drive to increase share capital. Further, though the equity of NACF has been small, Government has strengthened NACF financially by providing loans from time to time. To enable NACF to build up its equity, assurances were obtained that NACF would require its member cooperatives

to invest in its shares to the extent of at least 2% of their borrowings from it by December 31, 1973 and 3% by December 31, 1974.

Special Fund

4.09 The special fund (para 3.13) would be made up of the proceeds from the IDA credit, which would be transferred to NACF on the basis of sub-loan disbursements and the sum of W 1,400 million, which Government has agreed to provide as loan by September 1, 1974. Of the latter, an initial sum of W 350 million would be provided as a condition of credit effectiveness and the balance from time to time so that the amount available in the fund is always at least W 350 million. Upon completion of the study of NACF by management consultants (para 4.21), Government would decide, in consultation with IDA, whether the resources in the special fund would be retained as a long-term loan or held in some other form. If retained as a loan, the repayment period should not be less than 15 years, including five years of grace. NACF would pay interest at 7% per annum on the proceeds of the IDA credit and the Government loan. Assurances were obtained during negotiations that NACF would utilize the special fund resources in line with the policy statement agreed with IDA (Annex 5).

Arrears and Collection

4.10 Loan recovery was adversely affected by bad crops in 1967, 1968, and 1970 and the arrears of NACF and Kun cooperatives rose from W 3 billion in 1966 to W 9 billion (8.9% of outstanding loans) in 1970. This deterioration also reflects the impact of the rapid expansion of NACF operations and of the shortage of resources that led NACF to make medium-term loans for agriculture in smaller amounts and for shorter periods than were necessary (para 4.16). Overdues for more than one year constituted only about 2% of outstanding loans and largely related to "usury debt" loans made to farmers, on Government direction, for clearing their debts to moneylenders. Collection records have otherwise been generally satisfactory. Liberal extensions (permitted if interest and at least a part of principal are paid), however, distort the picture so that the situation cannot be estimated precisely. NACF management has been watching with concern the increase in overdues and taken effective measures to keep them within reasonable limits. Assurances were obtained that active collection drives would be continued, that the procedure for granting extensions would be revised, relating them to crop failure; that data would be collected on amounts falling due for repayment and on amounts extended, and that NACF would determine the period of loans on the basis of debt service capacity (para 4.16).

4.11 At the end of 1970, NACF had accumulated W 661 million of bad debts resulting from long-term irrigation and usury debt loans at Government instance. NACF has sought, but not yet received, a Government grant for the write-off of these. Assurances were obtained at negotiations that an amount of W 661 million would be made available to NACF by Government by December 31, 1973 for writing off bad debts. Other bad debts of NACF and Kun cooperatives, at the end of 1970, were roughly estimated at about W 1,500 million, which is a negligible proportion of loan portfolio. The extent of bad debts cannot be precisely ascertained, mainly because of NACF's liberal loan

extension policy (para 4.10). Availability of quasi-equity capital from long-term loans (para 4.09) would enable NACF to improve its profits and make provision for bad and doubtful debts. During negotiations, assurances were obtained that NACF would create and maintain an appropriate level of provision for writing off bad debts in line with the auditor's recommendations (para 4.23).

Organization and Management

4.12 The General Assembly of NACF, made up of member cooperatives, elects auditors and, through the Representatives Meeting elected by it, approves NACF's business plan, budget and accounts. The Administration Board, the policy-making body, consists of the President of NACF (appointed by the President of the Republic of Korea), the Ministers in charge of Finance and Agriculture and Forestry, the Governor of the Bank of Korea, and five members elected by the Representatives Meeting, including two agricultural economists (Annex 3).

4.13 The President of NACF is assisted by two Executive Vice-presidents and six other vice-presidents (Annex 3, Chart 2). NACF total staff is about 1,500, including agricultural technicians.

4.14 The top management of NACF is experienced and generally competent but experience in appraising and supervising development loans is limited. Loan appraisal methods and procedures would be improved by the technical unit to be set up under the Project (para 3.16). Establishment of the unit and appointment of the Project Manager and the farm management expert (in consultation with, and on terms and conditions satisfactory to, IDA) would be conditions of credit effectiveness.

Training

4.15 Most of NACF's staff have completed a two-year course at its Agricultural Cooperative College, which also runs training courses for cooperative staff and leaders. Facilities, however, need expansion and courses should be more practical and emphasize lending policies and procedures. A series of special courses of six to eight weeks would, therefore, be organized at the college, each to train 20 to 25 members of the appraisal staff of NACF and Kun cooperatives. NACF would be assisted by the farm management expert in preparing a syllabus and teaching materials and in organizing and conducting the courses (para 3.09). Assurances were obtained at negotiations that such courses would be organized.

Terms and Conditions of Project Loans

4.16 Because of NACF's lack of resources and suitable staff, the size of loans and their maturity are often determined more with a view to extensive coverage of borrowers and rapid turnover of funds than on financial and technical considerations. Norms would, therefore, be drawn up for each type of investment in regard to the required outlay and incremental production and

income, and be used as the basis for loan appraisal. Assurances were obtained during negotiations that lending policies of NACF would be improved as indicated.

4.17 The staff of NACF and Kun cooperatives would assist applicants with their loan requests and appraise sub-loans on the basis of farm plans and returns from incremental investments. Loans would be supervised by technical staff who would periodically visit the sub-borrowers' farms.

4.18 NACF would normally make Project loans to farmers through Kun cooperatives satisfying the conditions set out in the policy statement on financial soundness and operational efficiency (Annex 5). Where the loans could not be routed through a Kun cooperative, NACF would lend directly to the sub-borrower.

4.19 Interest rates charged by NACF on agricultural loans vary according to source of funds and purpose of loan. Rates on borrowings from the Bank of Korea and the Government range from 2% to 8% and, further, the Government has agreed to subsidize NACF to cover the difference between the cost of its deposits and the rate it charges on agricultural medium-term loans. The existing rate of 9% on medium-term loans appears unduly low, and prevents NACF from earning significant profits, despite subsidies. On the average, the cost of NACF's deposit resources is 12%, and present administrative costs, roughly estimated at about 2%, will go up if appraisal and supervision improve. The rate should also help cover bad debts and include a 3% margin for the Kun cooperatives that would channel the loans. A rate higher than the existing 9% would be well within the capacity of the sub-borrowers who represent the commercial sub-sector of Korean agriculture. They will receive a financial rate of return of 18% or more and would not be required to bear any substantial rise in taxes. Nor is an increase in the existing rate likely to discourage them, as Project loans would be larger and have longer maturity than those granted by NACF at present. The rate of inflation in Korea has been 8 to 10% per annum in the last few years and is likely to continue in this range for several more. The interest rate should therefore be sufficiently high to offset the loss in value of the principal and to cover increasing costs. The ruling interest rates on loans and deposits, even in the institutional sector, have been relatively high in Korea (Annex 2, Table 1), and therefore funds advanced at the low rate of 9% for agricultural purposes could be diverted to other uses. On all these considerations, a minimum rate of interest of 15% on medium-term agricultural loans would be justified. However, as too drastic a rise over the present rate of 9% might discourage potential investors, the rate would be raised to 12%. Any rate below this would imply a definite subsidy to farmers. Assurances were obtained at negotiations that the rate of interest charged to sub-borrowers on the medium-term and long-term loans under the Project would be raised to not less than 12% as a condition of credit effectiveness. A margin of 3% would be paid to Kun cooperatives.

4.20 Cash flows of typical sub-borrowers given in farm models (Annexes 8 to 11) show that the following repayment periods for loans would be appropriate:

Lending Categories	Grace Period	Repayment Period	Total
	(in years)		
Apples	7	5	12
Grapes	4	6	10
Peaches	4	4	8
Pears	6	4	10
Sericulture	3	5	8
Mushroom	3	5	8
Broilers	1	4	5
Laying hens	1	4	5
Hogs	1	4	5

Assurances were obtained that these periods would not be exceeded.

Administrative and Accounting Organization

4.21 NACF has expanded and diversified operations considerably in the last few years and, as a result, accounts and other management information have not yet been so organized that NACF's operational policies can be quickly or accurately determined. Organization and working procedures must also be streamlined. NACF has made some improvements such as changing the departmental set-up and attempting estimates of results by business sector, but the available information is still inadequate for management purposes. Similar problems also exist at the Kun cooperatives level. A review of the existing organizational, financial, and accounting procedures of NACF and, to the extent required, of Kun cooperatives, is, therefore, necessary. An international firm of management consultants would be invited, after consultation with IDA, to undertake the review, recommend measures for improvement and assist in their implementation, including the installation of a system of cost accounting for NACF. Terms of Reference would be as in Annex 7, subject to modification in the light of the study of certain broad aspects of the working of NACF now in progress as part of an agricultural sector review being carried out by the Michigan State University at the request of the Korean Government and with funding by USAID. Assurances were obtained at negotiations that, following this study, Government would agree with IDA on a program for the implementation of mutually agreed recommendations (including modifications thereof) and take all measures necessary for such implementation.

4.22 Government and NACF would review NACF's various activities and determine necessary measures for improving its operating results. It would be particularly important to ensure that NACF is adequately compensated by Government for losses suffered whenever it is required by Government to charge lower prices for its facilities and services than are justified by cost. Assurances were obtained from Government at negotiations that whenever Government directs NACF to perform any services, Government would provide sufficient funds to NACF to ensure that it does not incur any loss in performing such services.

Audit

4.23 NACF's operations are supervised by the Ministries of Agriculture and Finance, the Bank of Korea and the National Assembly Investigation Committees, and audited by the Board of Inspection of Government insofar as Government funds are involved. The only comprehensive audit, however, is that made by two auditors elected by the General Assembly, but since it is done with the assistance of NACF staff, it does not meet IDA's normal independent audit requirements. **Therefore, NACF accounts would have to be audited by independent auditors acceptable to IDA. Assurances to this effect were obtained during negotiations. The first independent audit relating to NACF's accounts for the year to December 31, 1971 started in February 1972 and the final audit report will be submitted to IDA not later than 3 months after credit effectiveness. An interim report containing the preliminary findings and views of the auditors has, however, been received. For subsequent years, final audit reports would be submitted within four months of the close of each financial year.**

V. PRODUCTION, MARKETING, PRICES AND FARMERS' BENEFITS

A. Production

5.01 The projected incremental output of the Project at full development is shown below, compared with the estimated national consumption levels at that stage.

Commodity	Full Development Year	National Consumption in 1970	Consumption at Full Development	Incremental Project Output	Incremental Output as % of Consumption
		'000 m Tons			%
Apples	1985	210	572	25.6	4
Grapes	1980	34	81	12.2	15
Peaches	1984	82	152	17.7	9
Pears	1985	60	124	14.0	11
Broilers	1974	40	58	4.6	8
Pork	1974	128	161	0.9	0.6
Eggs (million)	1977	1,967	3,147	122.0	4

5.02 The incremental Project output for sericulture and mushrooms would be primarily for export. Compared with 1979 world production, as shown below, such output would be negligible.

	World Production		Korea Production		Project Incremental Production	Project Output as % of World Production 1/	Project Output as % of Korea Production
	1969	1979	1969	1979	1979	1979	1979
	'000 tons					%	
Raw Silk	50	74	3	13	0.3	0.4	2.3
Mushroom	300	480	4	14	3.2	0.6	22.8

1/ It is assumed that world production will increase by 4% for silk and by 5% for mushrooms (FAO and IBRD economic department estimates); Korean production would increase by 15% for silk and 10% for mushrooms.

B. Marketing and Prices

Fruit and Livestock Products

5.03 Incremental Project output of apples, grapes, peaches, pears, broilers, pork, and eggs, which would be predominantly for the domestic market, appears modest, especially in view of the time needed to reach full development. The income elasticities of demand in growing urban centers are relatively high, ranging from 0.44 for peaches to 1.02 for poultry meat (paras 2.11 and 2.14). Priority for on-farm investments under the Project is based largely on these favorable domestic market prospects, though there are also possibilities of exporting to Japan. Prices of fruit, livestock and poultry products have been firm, rising more rapidly than the index of all agricultural commodities (Annex 1, Table 3).

Silk

5.04 The world demand for raw silk, after a short period of decrease because of preference for synthetic fibers, has shown a constant increase since 1965 (Annex 9, Table 2) and is expected to continue to expand (para 5.02). FAO estimates that the gradual upward trend will average 4% a year 1/. Export prices in recent years have also shown a rising trend, which has enabled Korea to maintain a comfortable balance in the stabilization fund, while granting farmers progressive increases in cocoon prices (Annex 9).

Mushroom

5.05 In Korea, domestic consumption of mushrooms is confined mostly to the wild variety, while mushroom raising specializes in those for export only. Export of cultivated mushrooms has shown a remarkable upward trend (Annex 10) and, up to now, the main limiting factor has been the country's mushroom raising capacity. Processors generally buy at prices that exceed guaranteed minimum producer prices. Export prices and producer prices have increased steadily since 1965.

1/ FAO Trade Yearbook, 1970.

Market Channels and Outlets

5.06 Farmers have a choice among a variety of market channels and outlets, which are described in detail in Annexes 1 and 8 to 11. Processing facilities for fruit and mushrooms are adequate. Although most fruit and livestock products are handled through private trade channels, cooperatives play a significant role in marketing. NACF operates several marketing centers in each of the five main urban markets (Seoul, Pusan, Taegu, Kwangju, and Taejon), at which fruit, vegetables, eggs and other commodities are sold at auction to accredited merchants who, in turn, sell to retailers and/or consumers. The percentage of fruit processed in 1969 (apples, 1%; grapes, 12%; peaches, 7%; and pears, 14%) is small but increasing, and the loan now under consideration by the Federal Republic of Germany would assist NACF in expanding and improving cold storage and processing facilities. Marketing of cocoon and mushrooms is regulated by Government under the 1971 Export Promotion Law, which requires exclusive sale to processors directly or through NACF for export (Annexes 9 and 10).

C. Producers' Benefits

5.07 Based on assumptions detailed in nine illustrative farm models (Annexes 8, 9, 10 and 11), the financial results of Project investments are estimated as follows:

	Apples	Grapes	Peaches	Pears	Seri-culture	Mushroom	Eggs	Broilers	Swine
Unit Size	2.0 ha	1.5 ha	2.0 ha	2.0 ha	0.4 ha	0.7 ha	2000 layers	4000 birds	50 hogs
	W'000								
Capital Investment	1,673	1,104	786	1,425	263	36,424	1,886	1,924	285
Loan	1,000	900	540	840	200	29,100	1,500	1,540	230
Gross Income at Full Development	3,640	1,571	987	3,120	438	20,480	5,714	5,108	1,453
Production Cost	632	401	242	781	94	10,741	4,793	4,577	1,129
Net Income Before Debt Service	3,008	1,170	745	2,339	344	9,739	921	531	324
Debt Service	277	219	178	276	56	8,073	494	507	76
After Debt Service	2,731	951	567	2,063	288	1,666	427	24	248
	Percent								
Financial Rate of Return	29	40	30	29	18	25	34	36	58

5.08 When all on-farm investments have reached full maturity, the farmers benefiting from sub-loans would be assessed for payment of land tax at the rate of 20% of 'standard' net income. However, the standard net income established by Government on a regional basis does not take into account the incremental production resulting from new investments (Annex 1). Under existing tax legislation, the farmer's projected net income may not, therefore, lead to substantial new tax liability.

5.09 Farm models show financial rates of return ranging from 18% to 58%. Varied sensitivity tests were applied to each model, assuming lower net benefit streams due to less favorable performance in investment costs, operating costs, and output prices. Financial rates of return remained satisfactory in all cases. The poultry and swine models, however, have shown marked sensitivity to lower sale prices, which is not unusual in these industries, especially in broiler and egg production where profit margins per unit are generally low. This sensitivity is due to the assumption that these farms would depend exclusively on purchased rather than on-farm produced feed (Appendixes 11-1, 11-2 and 11-3). However, production parameters are conservatively estimated, based on constant feed conversion factors, though they are expected to improve gradually. Aside from market and production risks considered in these sensitivity tests, success of the mushroom, poultry, swine, and sericulture sub-projects would largely depend on the quality of individual management. These risks, which do exist in view of the large number of participating farmers, would be minimized through guidance and supervision by NACF's specially trained loan officers and technicians.

VI. ECONOMIC BENEFITS AND JUSTIFICATION

6.01 The Project would extend financial support to about 12,000 farmers and enable them to meet their investment plans, which have so far been difficult to realize because of the shortage of credit. These would include about 9,000 farmers engaged in sericulture who would be enabled to progress from the traditional to the modern sector and attain the more rewarding economies of scale. Loans under the Project would also supplement agricultural programs of Government (paras 2.07 and 2.08).

6.02 Accurate data on the net employment resulting from the Project are not available; however, increased labor requirements for farm exploitation will increase working hours (sericulture and swine) for labor that is already employed and also generate opportunities for employing additional people (orchard, mushroom, and poultry). The equivalent of full-time jobs (300 days a year) generated by the Project would be about 6,000, distributed as follows:

	Orchard	Sericulture	Mushroom	Poultry	Swine	Total
Number of Farms	2,500	9,000	20	500	250	12,270
Number of Jobs	2,500	1,800	640	720	100	5,760

The incremental wages to be paid would average W 850 million (US$2.3 million). Based on the estimated income per rural household of approximately W 262,000 in 1974, the incremental wage earnings from the Project would provide income for about 3,500 rural households. This does not include the incremental employment and earnings generated by processing and marketing.

6.03 On the institutional side, the Project would provide for technical services that would help NACF improve the skill of its credit operations staff and initiate the process of NACF reorganization.

6.04 The overall impact on the balance of payments (about US$9 million equivalent per year by 1979) would not be substantial, as only mushrooms, silk, and small quantities of fruit would be exported.

6.05 For the Project as a whole, the taxes generated by Project investments and operations would be largely offset by the bulk of subsidies paid by the Government (para 5.08). However, poultry and swine would generate approximately W 240 million annual tax revenue a year (Annex 13 and Appendixes 13-1, 13-2 and 13-3).

6.06 The rate of return to the economy would be 37% ranging from 18% for sericulture to more than 100% for poultry and swine (Annex 13, Appendixes 13-1 to 13-3). Various sensitivity tests applied to the costs and benefits still give satisfactory rates of return. The high return shown by poultry and swine models is largely due to the relatively high tax component of the imported ingredients of the feed meal and to the good prices paid for meat and eggs in Korea.

VII. RECOMMENDATIONS

7.01 During negotiations, the following principal points were agreed to:

That Government would:

(a) make a sum of W 350 million available for setting up a special fund in NACF as a condition of credit effectiveness and provide, in all, a sum of W 1,400 million (inclusive of this sum of W 350 million) as a loan to NACF not later than September 1, 1974 which will be for a period of not less than 15 years and pass on the proceeds of the IDA credit to NACF on the same terms and ensure that this Special Fund is constituted and operated as set out in Annex 5 (para 4.09);

(b) make available a sum of W 661 million to NACF by December 31, 1973 for writing off its bad debts (para 4.11);

(c) compensate NACF for losses suffered whenever it directs NACF to perform any services (para 4.22).

And that NACF would:

(a) construct buildings whenever their total cost exceeded US$75,000 subject to local competitive bidding (para 3.14);

(b) require member cooperatives to invest in NACF shares to the extent of at least 3% of their borrowing from it by December 31, 1974 (para 4.08);

(c) arrange for an international firm of management consultants to study the existing system of the accounts and organization of NACF and implement their recommendations, as agreed with IDA (4.21).

7.02 Conditions of effectiveness are:

that Government would:

make available a sum of W 350 million for the creation of a special fund in NACF (para 4.09);

and NACF would:

(a) establish the technical unit and appoint the Project Manager and the farm management expert on terms of reference satisfactory to IDA (para 4.14 and Annex 6); and

(b) raise the rate of interest charged to sub-borrowers on the medium and long-term loans under the Project to 12% (para 4.19).

7.03 Subject to the above conditions, the Project is considered suitable for an IDA credit of US$10.5 million.

May 2, 1972

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Agricultural Background

General

1. The Republic of Korea (ROK) has a total land area of approximately 10 million ha, of which about 2.5 million ha (1 million ha irrigated) are cultivated, 6.5 million are in natural vegetation and forest, and 1.0 million are in basic infrastructure and cities. Of the total cropped area (3.6 million ha), about 80% is devoted to cereals and soybeans; one-third (1.3 million ha) of the cropped area is in paddy.

2. ROK is a hilly country of diverse geology--archeozoic rocks, granite, gneiss, mica schists and other metamorphics; cretaceous and tertiary sedimentary in the southeastern part of the peninsula; and volcanic in the southwest coast and Cheju Island. Four-fifths of its surface is below 500 m of elevation. The eastern coast is rugged, while the western coast is a network of estuaries and tidal flats. Main rivers (Han, Nakdong, Somjin, Yongsan and Kum) originate in the east and central "hilly backbone" and drain to the west and south.

3. Most of the intensively farmed land is alluvial and lies along the river basins, valleys and coastal margins. The south has more extensive plains and is favored by a mild winter. While all valley lands are settled and under some form of utilization, future gains in production and productivity can be achieved by:

(a) using improved seeds and planting material;

(b) rearranging paddy fields (irrigation and drainage) and consolidating land;

(c) improving watershed management;

(d) switching to high value crops;

(e) minimizing use of valley lands for basic infrastructure; (each year about 10,000 ha of good cultivated land goes to urban uses, factories, highways, and such); and

(f) developing and settling high uplands.

4. Although piedmonts and mountains (high uplands) are practically untouched, some hills have been denuded of their original coniferous trees and now are either covered by a secondary growth of herbs and bushes or devoted to rainfed crops, reforestation and human settlement. These uplands have good potential, and studies and watershed management pilot schemes show that several hundred thousand hectares could be brought into high-yield production (para 13).

5. The climate is continental. ROK has a pronounced rainy season in the summer and dry winters. The yearly rainfall varies from about 1,600 mm along the southern shores to 800 mm in the area adjacent to Taegu. Average annual temperatures increase from 10°C in the north to 15°C farther south. Winter temperatures are well below freezing. However, by using greenhouses made of bamboo and plastic, growing seasons are extended for high value crops. Farm production is subject to fluctuations resulting from drought and typhoons.

Role of Agriculture in the Economy

6. Agriculture 1/ contributes to 28% of the GDP and about 26% of annual export value. It also provides a livelihood for nearly half of the population. Agriculture grew at 5.5% from 1962 to 1966 and 2.9% annually from 1967 to 1969. During 1969, GNP growth registered an all-time high of 15.9% (13.3% in 1968). All major targets of the Second Five-Year Development plan, ending in 1971, were exceeded, except those in the agricultural sector. While the Third Plan (1972-76) postulates an accelerated rate of growth in agriculture, it also predicts that agriculture's share in the economy will decline to about 21% of GNP by 1976.

Production and Trade

7. Production. Except for vegetables, fruits (especially apples) and cocoon, overall crop production has shown no significant increase (Table 1). The upward trend of fruit and vegetables is due partly to skilled and price-responsive farmers, partly to physical integration of the country through a network of modern highways and transport facilities 2/, and partly to the income elasticities of demand among the urban population. Mushroom and cocoon production have increased in response to favorable export markets. Grain, especially rice production, has been encouraged through Government policies designed to support prices above those of world markets, subsidize farm inputs and reach self-sufficiency in rice.

1/ Agriculture includes livestock, forestry and fisheries.

2/ Credit 25-KO, Credit 110-KO, and Credit 183/Loan 669-KO.

8. Seeds and planting materials are of poor quality and insufficient in quantity and their distribution leaves much to be desired. This is reflected in the low yields obtained in crops other than rice, as well as in the small amount of progress achieved through crop diversification. Improved seeds, as the core of a well-managed "package", where land, water and fertilizer play important roles, could help Korean agriculture achieve, during the Third Plan (1972-76), what was not achieved during the Second--gains in productivity. A more resourceful development program for seeds and planting materials would be a step in this direction, as would increased institutional support in multiplying and distributing improved planting materials.

9. Trade. Agricultural export value has shown an upward trend, mainly because of increasing shipments of straw mats, mushroom, silk, tobacco, ginseng and fish products (Table 2). Although agricultural imports have increased at a lesser rate, the increasing reliance on imported cereals gives rise to concern for reasons of foreign exchange commitments and the balance of payments. Annual grain imports exceed 2 million m tons while net agricultural imports have more than quadrupled since 1965. The following table gives data on grain imports for the last three years:

Imports

Grains	1969	1970	1971 (Estimated Imports)
	'000 tons		
Rice	755	541	1,025
Wheat	1,369	1,254	1,258
Barley	67	-	-
Corn	174	284	354
Soybeans	24	36	67
Total	2,389	2,115	2,704

10. At prevailing prices, the market value of the 1971 grain import program has been estimated at US$287 million. Provisional Third Plan projections are:

	1976 Target Figure			Estimated Average Annual Increase	
	Demand	Supply	Difference	Demand	Supply
	'000 tons			%	
Rice	4,636	4,675	39	1.6	2.5
Barley	2,406	2,406	-	2.3	2.3
Wheat	1,989	488	-1,501	4.2	4.6
Corn	805	149	-656	20.7	12.8

Land Tenure and Use

11. The successful Korean post war land reform established a maximum size of 3 ha for farm holdings and 20 ha for orchards, range, pasture and forest lands. However, average holding in ROK is 0.9 ha.

12. Government is attempting to improve land use through pilot schemes for watershed management, with the technical assistance of the United Nations, and through "crash programs". Three years' experience with pilot schemes in three small watersheds (Ansong Chon, Tonjin and Sangju) indicates that, through water management, bench terracing, small dams and flood control, unused high uplands can be converted into properly cultivated land at reasonable cost. Preliminary results demonstrate that:

(a) with proper rural zoning, drainage, irrigation, lime, and fertilizer, rainfed paddy yields can be increased from 3.3 to 5.3 tons per ha;

(b) 1 ha of fishponds could, on the average, irrigate 6 ha of paddy and still maintain 1-m depth of water for fish culture; and

(c) high uplands have good potential for forestry and livestock development, the latter through range and pasture management.

13. One of the two crash programs initiated in 1968 involves groundwater development in the southern part of the country. The other deals with land consolidation and paddy rearrangement. During the Second Plan period, 150,000 ha of land were consolidated and an area of equal size is to be consolidated by 1976 under the Third Plan. The newly created Agricultural Development Corporation (ADC, established in 1970) has assumed responsibility for both programs, including agricultural mechanization and rural housing.

Support Services

14. The main Government and semi-Government agencies supporting agriculture (besides NACF) are:

The Ministry of Agriculture, Forestry and Fisheries (MAF);

The Agricultural Development Corporation (ADC); and

The Agriculture and Fisheries Development Corporation (AFDC).

The MAF formulates agricultural policy; through its Office of Rural Development (ORD) it conducts research and advises farmers through a nationwide extension service; MAF is especially active in a seed-improvement program; maintaining and improving quality standards of agricultural commodities is one of its more important regulatory functions.

15. Pricing of vegetables, fruit, and livestock products is not regulated or controlled. Such items are sold either on the basis of contractual arrangements (with processing plants, brokers, dealers) or in the marketing centers by auction to accredited merchants. Because of the relative freedom allowed in marketing this category of commodity, prices of vegetables, fruit, and livestock products increased by about 150.1% 116.3% and 112.7% respectively from 1965 to 1970, during which the average rate of increase for the entire agriculture sector was about 91.4% (Table 3).

16. Government is backing its agricultural policy with an active subsidization of certain inputs which should, in turn, influence indirectly the level of prices. Government subsidies on main items in 1970 were as follows:

Selected Planting and Breeding Stocks:	30-60%
Farm Equipment:	
Power tiller (10 hp)	23%
Power duster	11%
Power sprayer	48%
Speed sprayer	40%
Fertilizers:	30-40%

17. In 1968, the subsidy on farm equipment provided by the Central Government reached a peak of W 606 million (US$1.6 million), while fertilizer support amounted to W 1.6 million in 1968 and W 3.3 million in 1969. Farm mechanization subsidies were financed almost totally from the Property and Claims Fund (official Japanese transfers), which had an approximate balance of US$400,000 available at the beginning of 1971. It is expected that the subsidy will be substantially reduced in 1971 and nearly eliminated, for power tillers, in 1972.

Marketing

18. The Korean marketing system faces ever-increasing demands. The index of farm production, which increased from 95 in 1965 to 119 in 1969, is expected to increase further to 166 by 1976. Urban population, 50% of the total in 1969, is projected to reach 58% by 1976.

	1965	1966	1967	1968	1969	(1976)[1]
Index of Agricultural Production: (1964 = 100)	95.3	106.7	101.7	103.2	119.2	(165.7)
Urban Population, % of total	45.0	46.3	46.5	48.3	50.4[2]	(58.0)
Rural Population, % of total	55.0	53.7	53.5	51.7	49.6	(42.0)
Index of Urban Population: (1965 = 100)	99.0	102.0	103.0	107.0	111.0	(128.0)

/1 Projections of MAF and EPB.

/2 According to a sample survey, the percentage had already reached 54 in 1970.

19. One phenomenon associated with urbanization and rising per capita income is the income elasticity of demand for perishable and bulky commodities: fruit and vegetables and livestock products. In order to meet the increasing demands upon the market system, Government proposes to provide:

(a) an improved rural infrastructure, especially feeder roads (little progress has been made so far) and rural market centers for assembling produce for dispatch to terminal markets (Government has a program for establishing cooperative assembling centers for produce along its growing net work of super highways);

(b) storage and processing facilities (NACF's existing facilities are to be expanded with the help of a USAID loan and financial assistance from the Federal Republic of Germany is also under consideration);

(c) improved terminal market facilities (some of which have been financed by the Asian Development Bank);

(d) higher standards for grading, handling and sanitation at all levels (much remains to be accomplished); and

(e) an effective system for gathering, analyzing and disseminating statistical information on market arrivals, sales and prices (much remains to be done along these lines).

20. In the domestic market, farm produce may flow through one of the following channels:

(a) individual merchants;

(b) private firms;

(c) cooperative or Government channels; or

(d) a combination of these.

The share that flows through cooperative channels (mainly NACF or affiliated county level or specialized cooperatives) averages 30% of vegetables and eggs; 30 to 40% of rice reaching commercial markets; 35% of fruit; and 100% of the sericulture output (cocoon). In total, NACF's marketing activities in 1968 accounted for W 40 billion, or 50% of the estimated value of all farm output marketed that year. Export marketing, which is controlled by Government, is shared by private firms, NACF and Government although farmers and processors appear to have a preference for private export firms.

Taxation

21. The rural sector makes a relatively limited contribution to Government's tax revenues. In 1968 and 1969, taxes and public charges paid by the farmers amounted to about W 7.8 billion and W 11.0 billion, respectively, or approximately 3.7% and 4% of total tax revenue for the same years. Under existing provisions, 30.5% of the internal tax revenue is transferred by Central Government to local governments: 17.6% for financing general local expenditure and 12.9% for financing the local autonomous school bodies.

22. The taxes and public charges paid by farmers consist of taxes on expenditure, including custom duties on imported goods and taxes on production and income representing, mainly, agricultural land taxes. Farm inputs subject to import duty are mostly chemicals and machinery, including spare parts. Custom duties for chemicals are as follows:

(a) Wetting and emulsifying agents, 40% of CIF price;

(b) Solvents, 20% of CIF price; and

(c) Finished farm chemicals, 25% of CIF price.

Farm machinery and parts that can be purchased in Korea from local suppliers cannot be imported, except under special circumstances. Such special cases must be decided by the Ministry of Agriculture and Forestry (MAF): if permission to import is granted, items are subject to 100% tax (50% customs and 50% special duty). MAF is authorized to waive these taxes if the situation warrants such action.

23. For tax purposes, agricultural land is classified into Class A (mainly paddy and barley land) and Class B (mainly upland). For each, taxable net income is determined on the basis of standard production, prices and costs, as ascertained through annual farm business surveys. Tax payable on Class A land is 6% on "standard" net income, while the rates payable on Class B are:

(a) 10% on net income below W 60,000;

(b) 15% on net income from W 60,000 to W 180,000; and

(c) 20% on net income above W 180,000.

24. In the long run, i.e., when all on-farm investments have reached full maturity, the farmers benefiting from sub-loans would be assessed for payment of land tax at the rate of 20% of "standard" net income, as defined under Class B above. The Project would not generate significant incremental tax revenue for two reasons: first, tax liabilities are assessed on the basis of standard income, rather than on actual income and, second, there is a provision under which newly established poultry and swine farms are 100% exempt for the first six years and 50% exempt for the following three, while newly exploited (orchard) land is exempt for six years.

December 1, 1971

ANNEX 1
Table 1

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Agricultural Output

	1965	1966	1967	1968	1969	1970
	'000 tons					Preliminary
Grains						
Rice	3,501	3,919	3,603	3,195	4,090	3,940
Barley	1,807	2,018	1,916	2,084	2,066	1,974
Wheat	300	315	310	345	366	357
Corn	40	34	60	63	63	68
Soya	174	161	201	245	229	232
Others	110	115	81	123	102	78
Total	5,932	6,562	6,171	6,055	6,916	6,649
Pulses	27	31	30	38	38	45
Potatoes	116	138	113	123	120	n.a.
Sweet Potatoes	929	834	518	635	658	n.a.
Oilseeds	9	11	12	13	15	n.a.
Fruits						
Apples	167	174	190	199	219	211
Grapes	19	23	25	28	37	34
Pears	40	41	41	48	46	60
Peaches	54	63	71	72	68	82
Other fruit	25	24	25	38	37	n.a.
Vegetables	1,130	1,196	1,265	1,469	1,625	1,500
Cocoon	8	10	11	17	21	22

Source: MAF Yearbook 1970
The Bank of Korea Economic Statistics Yearbook 1971

Years of severe drought: 1967 and 1968 n.a.: not available

Good year: 1969

Typhoons: 1971

December 1, 1971

ANNEX 1
Table 2

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Value of Agricultural Exports and Imports

	1965	1966	1967	1968	1969	1970 Preliminary
	US$ million					
A. Exports						
Total Agriculture:	63.1	98.8	129.3	148.4	184.4	186.5
of which:						
Grains	4.7	8.1	1.1	0.6	1.0	n.a.
Mushrooms, Fruit and Vegetables	0.6	0.9	1.2	1.2	2.0	2.8
Special Crops (mainly Ginseng)	2.9	3.1	4.3	6.1	8.5	10.4
Other Crops (mainly tobacco)	1.1	6.9	7.2	8.2	14.0	11.9
Livestock	1.7	1.2	1.7	1.3	2.3	n.a.
Forest	0.3	0.4	5.5	0.1	0.3	0.1
Fish Products	21.9	28.7	47.2	40.9	43.5	29.3
Silk, Mats, Artificial Flowers, etc.	29.9	49.5	61.1	90.0	112.8	132.0
B. Imports						
Total Agriculture:	142.9	204.2	256.7	354.2	352.1	530.0
of which:						
Grains	54.3	81.3	79.5	129.5	85.1	166.5
Vegetables and Fruit	0.3	0.4	0.9	0.8	1.3	2.3
Special Crops (linseed, coffee, tea)	1.1	2.0	2.4	3.1	3.7	36.0
Other Crops (feeds, seeds)	0.4	0.7	4.3	12.8	15.1	88.6
Livestock	4.4	7.9	11.6	13.0	18.4	27.0
Forest Products	27.3	50.9	66.9	97.3	118.6	123.6
Fish Products	0.6	0.6	2.8	0.8	0.7	n.a.
Processed Meat, Milk and Meat Products	54.5	60.4	88.3	96.9	109.2	86.0
C. Net Imports	79.8	105.4	127.4	205.8	167.7	343.5
Net Imports, excluding forestry	52.5	54.5	60.5	108.5	49.1	219.9

Sources: MAF Yearbook 1970
The Bank of Korea Economic Statistics Yearbook 1971

December 13, 1971

ANNEX 1
Table 3

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Index of Farm Product Prices Received
by Farmers by Commodity Groups

1965=100		All Farm Products	Rice (Paddy)	Barley and Wheat	Vegetables	Fruit	Livestock and Poultry
1965		100	100	100	100	100	100
1966		106.1	105.6	94.6	127.6	102.2	108.4
1967		121.5	116.2	113.2	108.0	116.2	140.2
1968		142.3	136.8	123.6	109.9	149.9	183.3
1969		162.4	169.8	145.4	123.2	193.0	179.1
1970		191.4	186.8	162.8	250.1	216.3	212.7
1970	Feb.	177.2	173.5	153.5	226.5	201.3	192.0
	Mar.	179.8	172.9	154.7	228.7	107.9	201.3
	Apr.	183.6	176.0	157.7	232.4	212.8	211.3
	May	187.6	179.7	162.3	245.0	215.6	215.4
	June	191.0	183.8	157.4	270.0	215.6	216.1
	July	193.5	189.1	157.8	267.1	215.6	215.2
	Aug.	197.5	193.7	160.0	269.1	213.1	218.0
	Sept.	202.0	199.2	166.0	252.6	215.6	212.2
	Oct.	199.3	195.5	167.6	248.9	216.3	224.8
	Nov.	203.0	201.3	175.5	248.1	234.7	225.2
	Dec.	210.6	206.6	187.6	307.2	258.3	225.5
1971	Jan.	213.2	207.7	197.5	308.7	276.3	225.1
	Feb.	216.7	210.4	205.1	322.0	279.9	228.2
	Mar.	218.9	209.0	209.3	327.9	281.4	236.9
	Apr.	228.2	215.4	219.9	328.5	291.2	259.9

Source: NACF Monthly Review, June 1971

December 1, 1971

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Banking and Agricultural Credit

Banking System

1. The banking system of Korea consists principally of: (a) six commercial banks with a nationwide network of branches; (b) seven local banks, each with a smaller area of operation; (c) six branch offices of foreign banks; and (d) seven specialized banks, viz., Citizens' National Bank of Korea, Korean Housing Bank, National Agricultural Cooperative Federation (NACF), Central Federation of Fisheries' Cooperatives, Korean Exchange Bank, Korean Development Bank, and Medium Industry Bank. All the banking institutions are subject to the statutory authority of the Bank of Korea, which, as the central bank of the country, is vested with powers of currency issue, credit control and bank supervision. There are, in all, 1,432 bank branches in the country, a third of them being in Seoul and Pusan. The commercial banks accounted for 314 offices; the provincial banks for 83, NACF, Kun Cooperatives and the Federation of Fisheries' Cooperatives for 751; and the other specialized banks for 281.

Bank of Korea

2. The Bank of Korea has been operating indirect controls (such as the regulation of the reserve ratio) as well as direct controls (e.g., ceiling on bank credit), in coordination with relevant fiscal policies of Government, so as to promote stability in the monetary and credit aspects of the economy. The bank's outstanding loans and discounts increased from W 35 million at the beginning of 1970 to W 90 million at the end of the year and covered accommodation for agricultural, export and other commercial purposes.

Non-bank Financial Institutions

3. Korea also has three important non-bank financial institutions viz., Agricultural and Fisheries Development Corporation (AFDC), the Korea Investment Development Cooperation (mainly designed to foster the capital market in Korea), and the Korea Development Finance Corporation, engaged in industrial financing, underwriting, etc. The AFDC, a government-owned statutory corporation, finances equity investment and makes long-term and short-term loans for the development of industries connected with products of agriculture, forestry and fisheries. Some of its subsidiaries such as

silk companies, swine production and processing centers and a dairy plant provide some credit to farmers and other producers to ensure increased production.

Sources of Agricultural Credit

4. The role of commercial banks in agricultural credit in Korea has been negligible. Their outstanding loans and discounts for agriculture, forestry and fisheries at the end of 1970 amounted to W 11,694 million, of which W 325 million were for financing equipment. The contribution of cooperatives to the supply of credit and other services required by agriculture was, however, more significant. (The agricultural cooperative system in Korea is described in Annex 3.) According to a Farm Household Economy Survey, carried out by the Ministry of Agriculture and Forestry, of the borrowing of W 12,518 per cultivator household at the end of 1969, W 2,586 (21%) was accounted for by cooperatives and other public organizations, W 8,511 (68%) by individuals, and W 1,421 (11%) by others (including commercial banks). The survey also shows that only 34.4% of the borrowings went to finance agricultural purposes whereas more than one-half was for living expenses, ceremonies, educational expenses, etc. An elaborate Rural Credit Survey conducted in 1964 showed that agricultural cooperatives supplied about 23% of the borrowings of cultivator households, while other banking institutions accounted for only 1.2%. The important sources of credit, however, were "other farmers" (45.5%) and "relatives and friends" (18.0%). Interest rates charged by non-institutional agencies are reportedly as high as 60% per annum in many instances, though a gradual and limited decline in such rates is said to have resulted from growth in cooperative credit.

Interest Rates

5. Interest rates on deposits and loans of banking institutions in Korea have been maintained at relatively high levels since 1965 when an interest rate reform was adopted as part of the monetary policy of the Bank of Korea aimed at checking inflation, promoting savings and stimulating the flow of funds into the organized banking system. Lower rates were, however, permitted for priority sectors such as exports and agriculture. Tight money policy was also reflected in the reserve requirement ratios of banks, which, after being lowered in January 1971, stood at 16% for savings and time deposits and 26% for demand deposits. (The corresponding ratios for NACF and county cooperatives were, however, 13% and 20% respectively.) The last major adjustment of interest rates was made at the time of the won devaluation in June 1971 mainly with a view to rationalizing the rates charged on term loans. (Table 1 gives the rates on loans and deposits of banking institutions as of June 27, 1971 and the changes made thereafter.) Deposit rates range from 10 to 21% and lending rates from 22 to 24% except for priority sectors such as agriculture (9 to 15%) and exports (6%).

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Interest Rates on Deposits and Loans of Different Banking Institutions

A. Deposits
(Percent per annum)

	Up to June 27, 1971	After June 27, 1971 Where Altered
A. Deposit Money Banks (Including NACF)		
1. Time Deposits		
(a) 3 months	12.0	10.2
(b) 6 months	16.8	14.4
(c) 1 year - 2 years	22.8	20.4
(d) Over 2 years	-	21.3
2. New Household Deposits	9.6	8.7
3. Notice Deposits	5.0	-
4. Installment Savings Deposits	23.0	21.0
5. Passbook Deposits	1.8	-
B. N.A.C.F.		
1. New Farmers Deposit	12.0	10.2
2. Tax Payment Savings Deposit	12.0	10.2
3. Children's Deposit	-	8.7
4. Employees' Savings Association	22.8	21.0
C. Non-Monetary Financial Institutions		
1. Non-specific		
(a) 18 months	22.8	-
(b) 2 years	26.2	-
2. Development		
(a) 18 months	23.4	-
(b) 3 years	25.8	23.0
3. Installment Trust for Purpose		
(a) 18 months	22.8	
(b) 30 months	25.2	-
4. Postal Savings		
(a) Savings Certificates		
(i) 1 month	9.6	8.7
(ii) 3 months	12.0	10.2
(iii) 6 months	16.8	14.4
(iv) 1 year	22.8	20.4
(b) Fixed Term		
(i) 1 year	19.2	17.4
(ii) Over 1 year	23.4	20.4

B. Loans
(Percent per annum)

	Up to June 27, 1971	After June 27, 1971 Where Altered
A. Bank of Korea		
1. Advances to Government	2.0	
2. Commercial Bills: Rediscount	19.0	16.0
Loans	23.0	20.0
3. Loans for Exports	3.5	-
4. Loans for Suppliers of US Off-shore Procurement	3.5	-
5. Loans for Export Preparation of Agricultural and Marine Products	3.5	-
6. Loans for Imports	3.5	6.5
7. Loans for Military Supply Goods Procurement	24.0	-
8. Loans for Purchase of AID Goods	24.0	-
9. Rice Lien Loans	4.0	-
10. Loans for Agriculture and Fishery Projects	8.0 /1	-
11. Loans for Other Bills	26.0	24.0
B. Commercial Banks		
1. Discount of Bills	24.0	22.0
2. Loans for Exports	6.0	-
3. Loans for Imports	6.0	9.0
4. Loans for Export Preparation of Agricultural and Marine Products	24.0	22.0
5. Loans on Other Bills	24.0	23.0
6. Overdrafts	26.0	24.0
7. Loans on Collateral of Installment Savings	18.8	16.8
8. Loans for Installment Savings	24.0	22.0
9. Loans Overdue	36.5	-
10. Call Loan	21.0	19.0
11. Loans on New Household Deposits	11.6	10.7
12. Loans for Machine Industrial Promotion	12.0	-
13. General Commercial Loans		
(a) one year or less	-	22.0
(b) 1-3 years	-	22.5
(c) 3-5 years	-	23.0

/1 Rate of 5% temporarily effective from July 1, 1971 to September 30, 1971 and 8% temporarily effective from October 1, 1971 to June 30, 1972.

B. Loans (cont'd)

(Percent per annum)

	Up to June 27, 1971	After June 27, 1971 Where Altered
C. Agricultural Cooperatives		
1. From banking funds for:		
(a) Agricultural Production	15.0	-
(b) Agriculture and Forestry	24.0	22.0
(c) Fisheries		
(i) to fishermen	24.0	22.0
(ii) to cooperatives	24.0	22.0
(iii) for deep sea fishing	10.0	-
(d) Loans for Export Preparation of Agricultural and Marine Products	6.0	-
2. From Government funds for:		
(a) Agricultural Production		
(i) short-term	10.0	-
(ii) medium-term	9.0	-
(iii) long-term	9.0	-
(b) Irrigation	3.5	-
(c) Warehouse Construction	8.0	-

December 1, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

National Agricultural Cooperative Federation (NACF)

General

1. Though the cooperative system in Korea is of recent growth, an organization of farmers, known as "Ke" has traditionally functioned at the village level as a voluntary and informal association for specific purposes. Financial associations which provided agricultural credit in earlier years were reorganized and consolidated in 1956 to form the Korean Agricultural Bank, while agricultural cooperatives began to be organized in 1957. The two agencies were merged upon the enactment of the Agricultural Cooperative Law in 1961. The three-tier agricultural cooperative system thus evolved consists of the National Agricultural Cooperative Federation (NACF) at the national level, the county (Kun) cooperatives at the intermediate (county) level, and primary cooperatives at the village base (Organizational structure is shown in Chart 1). About 93% of the farmer households in Korea hold cooperative membership.

2. The Ri Dong, or village cooperatives, are multi-purpose in their functions, have an area of operation of one or several villages, and require a minimum membership of 20 persons. The NACF has been pursuing a program of consolidating these cooperatives into larger, viable units at the level of the Myon (an administrative division smaller than the county). As a result, their number, which was about 16,000 in 1968, dropped to 6,714 by end-1970 and is expected to be reduced by the end of 1972 to 1,500. The functions of primary cooperatives at the Myon level are, however, more diversified than those of the single village cooperatives and constitute a comprehensive service including distribution of consumer goods and agricultural inputs, storage, marketing and other facilities. Primary village cooperatives also operate a mutual credit scheme that mobilizes resources from members for making loans for miscellaneous purposes. Supported by a loan from NACF, this scheme has made good progress, with deposits of the order of W 3,270 million and outstanding loans of W 4,512 million by April 1971.

3. The most important tier of the cooperative structure in Korea is, in some respects, that of the county cooperatives which function at the intermediate level and provide all the services required by farmers. There are 140 Kun cooperatives, each with a membership of at least 15 Ri Dong Cooperatives, operating through a countrywide network of about 400 branch offices that provide banking and other services. With deposits of W 88,015

million and outstanding loans of about W 80,000 million at the end of 1970, their operations are sizeable and closely integrated with those of the NACF.

4. Special cooperatives (outside the three-tier structure) are organized on the basis of commodities handled rather than geographical jurisdiction and consist of 60 horticultural and 94 livestock organizations. They provide a wide range of services to their members including, in particular, inputs and marketing and processing of produce, but excluding credit in cash.

5. The National Agricultural Cooperative Federation is the apex organization of the cooperative structure with headquarters at Seoul and a branch in each province. The NACF functions as an instrument for the implementation of national policies in agriculture and is hence intimately associated with Government in its operations. It is partly in pursuance of this responsibility that it undertakes a variety of banking, trading and promotional functions, including credit, purchase and supply, marketing, processing, guidance and management. To coordinate these activities under the Project with relevant Ministries and other agencies, a Project Coordination Committee would be set up as per guidelines in Appendix 3-1.

Constitution

6. The working of cooperatives is governed by the Agricultural Cooperative Law of 1961 and the by-laws of individual institutions. The president of each cooperative should, ordinarily, be elected but, in terms of special legislation, the President of the NACF (who is himself appointed by the President of the Republic of Korea) can appoint the presidents of all other agricultural cooperatives. He is, however, authorized to entrust provincial managers of NACF with the appointment of the presidents of Ri Dong cooperatives. The general assembly of NACF, which consists of the representatives of the member cooperatives, elects representatives and auditors and may amend the Articles of Incorporation and make recommendations in regard to other matters. The Representatives Meeting consists of the president and 29 representatives of the member cooperatives and has the power to approve and ratify the business plan, budget and statement of accounts for each fiscal year and to elect members of the Administrative Board of NACF. Member cooperatives from each province elect three representatives, and three others are elected from among the special cooperatives. The chief policymaking body in NACF is the Administration Board, composed of the President of the Federation, Minister of Agriculture and Forestry, Minister of Finance and Governor of Bank of Korea, and five members elected by the Representatives Meeting, including two agricultural economists.

7. Each member of a cooperative is required to buy at least one share. The value of a share is W 1,000 in the primary cooperatives, W 3,000 in the special cooperatives and W 10,000 in the Kun cooperatives and NACF. NACF has been promoting a drive to increase share capital subscription at all levels. As against targets of W 461.0 million, W 251.3 million and W 1,796.0 million set for NACF, Kun and village cooperatives for 1970, actual increases achieved amounted to W 465.0 million, W 233.3 million and W 1,455.0 million, respectively.

Organization and Staff Training

8. The President of NACF is assisted in his day-to-day direction of the cooperative system by two Executive Vice-Presidents appointed by him for a term of three years, subject to the approval of the Administration Board. One of them is in charge of credit and banking and the other in charge of non-credit activities. Six more vice-presidents supervise the various departments. (Details are shown in Chart 2.) The departmental set-up of NACF has been reorganized from time to time to improve coordination and integration of related activities. As steps in this direction, the Planning Department and the Fund Operations Department were created to handle budgeting and mobilization and use of resources, with reference to the needs of the various business activities. To ensure the independence of the inspection department, it was placed directly under the charge of the President. The top management of NACF is generally competent and experienced.

9. NACF branch offices guide and serve the Kun cooperatives in the provinces. The headquarters and branches together have a staff of about 1,500, which includes a limited number of men with technical knowledge of agriculture, livestock, animal husbandry, etc. employed mainly in the Farm Guidance, Livestock Guidance, and Loan Appraisal Departments.

10. Staff is recruited periodically by NACF to meet its own requirements as well as those of Kun cooperatives. Most new staff are persons who have completed a two-year diploma course at the Agricultural Cooperative College run by the NACF, though a few university graduates are also recruited to be trained as officers. In the recruitment examination, there is, however, more emphasis on law, accountancy and general knowledge than on agriculture. Salaries paid by NACF are better than those of Government but not as high as those at commercial banks. Qualified persons are said to be sometimes reluctant to work for NACF, partly because of the wide range of its functions and partly because of the possibility of their being posted to small towns.

11. The Cooperative College offers a two-year course in cooperative business (including practical training) to about 100 candidates selected on the basis of an entrance examination and on the recommendation of the President of the Kun cooperative of the area from which the candidate comes. Each participant receives free tuition and subsistence and undertakes to work for cooperatives for at least three years. The curriculum of the

course is comprehensive but, because of preoccupation with many general subjects, does not pay sufficient attention to operational aspects of credit such as appraisal and supervision.

12. The College also offers the following training facilities:

(a) A seminar-type course of one to two weeks for comparatively high ranking officers such as managers of Kun cooperatives, section chiefs and managers of Departments in NACF;

(b) A senior refresher course of one to four weeks for assistant managers of Kun cooperatives and assistant chiefs of NACF;

(c) A junior refresher course of one to four weeks for clerks who have been in service for some time;

(d) A course of three to eight weeks for new employees of NACF who have not had earlier cooperative training; and

(e) Seminars and courses of one to two weeks for presidents and managers of village cooperatives.

Classrooms and dormitories and teaching staff are generally satisfactory. The training courses are not practical in their content and do not place enough emphasis on such matters as scrutiny of credit requests and follow-up and supervision of loans, and facilities would have to be expanded to cover growing needs.

13. As the successful execution of the Project would require, at NACF headquarters, its branches and Kun cooperatives, staff trained in loan appraisal, a series of special training courses of six to eight weeks would be organized at the Cooperative College. Each course would help train 20 to 25 staff members and cover (a) the appraisal of Project loan applications, including examination of technical feasibility, scrutiny of proposed investment and operational costs and analysis of incremental revenue and repaying capacity, on the basis of norms and models drawn up for each category of sub-projects and (b) follow-up and supervision of loans. Apart from lectures by the college staff, there would be talks by some NACF officials and a few visiting specialists from the Agricultural Research Institute, the Sericulture Association, mushroom processing factories, and the Office of Rural Development. The services of the farm management expert, to be hired to assist the Project Manager (on terms of reference given in Annex 6), would also be utilized for the preparation of the syllabus and teaching materials for the course and for organizing and conducting the first two courses.

14. It would also be necessary to modify the curriculum for the cooperative course at the college to incorporate the main aspects of loan appraisal and to organize a few seminars at the college for office-bearers of Kun cooperatives participating in the Project. The existing dormitory and library facilities at the Cooperative College are not sufficient for the additional training courses and seminars and will have to be expanded.

Lending Policies and Procedures

15. Credit operations of NACF comprise short-term, medium-term and long-term loans and cover agricultural and non-agricultural purposes. Some accommodation is also provided in the form of credit sales and advance payments for purchases. Loans are made to individuals (both members of cooperatives and non-members), and to cooperatives, associations and other juridical persons under terms and conditions that vary according to purpose and source of funds. Farmers are usually financed through Kun cooperatives and their branches or directly by NACF, and only rarely through Ri-Dong cooperatives.

16. Short-term loans for agricultural production (especially for rice and barley) are made from banking as well as from budgetary funds, usually at an interest rate of 15% for a period of less than one year, the due date being fixed two to three months after harvest to allow for sale of produce at reasonable prices. Loans up to W 200,000 are based on the borrower's signature without any supporting collateral or guarantor. Such loans are also made for other crops in selected areas where there are programs for increased production. Medium-term loans--usually for five years and in some instances for eight years--are also made from banking funds as well as from budgetary funds at an interest rate of 9% and on the security of mortgage of land or real estate. Medium-term loans are made for such purposes as raising cash crops (vegetables, ginseng, sericulture) and livestock, for helping farmers recover from disasters such as drought and flood and for replacing straw roofs with tiles.

17. Short-term loans are made to cooperatives and some other producer associations for working capital purposes and for purchase of produce from cultivators. NACF also makes short-term loans for commercial purposes: these include (a) working capital loans for commercial farmers; (b) special export loans for those who raise mushroom, silk cocoons, ramie, etc. at the low interest rate of 6%, supported by refinancing facilities from the Bank of Korea; (c) general commercial loans for urban housing, trade and similar purposes, and (d) loans up to 80% of fixed deposits on the security of such deposits. All commercial loans (except export finance) are charged interest at 22%. Long-term loans are made for a period of 35 years at 3.5% to irrigation associations direct or through the Agricultural Development Corporation.

18. Appraisal methods of NACF and Kun cooperatives need much improvement. Partly because funds were inadequate for meeting the full requirements and partly because of the lack of suitable staff for appraisal, there has been a tendency to distribute loanable funds widely and to fix maturities, mainly with a view to rapid turnover of funds without considering incremental income and repaying capacity. Though NACF has been recently trying to improve the quality of appraisal and strengthen the appraisal staff, it is necessary to review loan policies and appraisal methods so as to base them on technical and financial analysis of projects with reference to required outlays, incremental production and income and repaying capacity. The farm management expert to be recruited for assisting the Project Manager would help draw up norms for these purposes and ensure their proper application on appraisal of loan requests in the field. Reorientation of lending policies on these loans is also sought through the Policy Statement (Annex 5).

19. Powers of loan sanction are being increasingly decentralized by NACF. Loans up to W 500,000 can be approved by the managers of Kun cooperatives, while loans above this ceiling but below W 3 million can be approved by the manager of a branch of the NACF, if recommended by a loan committee, consisting of the manager, submanager, and the chief of the concerned section. Still larger loans are approved by the President of the NACF on the recommendation of a loan committee consisting of the two executive vice-presidents and the vice-president and the manager in charge of the Loan Department.

20. Separate ceilings have been set for loans for different purposes. While these have been fluctuating, the highest limit of loan so fixed is for livestock, viz., W 10 million. The ceiling for orchards and sericulture is W 1 million. The size of an individual loan is usually restricted by the shortage of available funds and by the value of the collateral offered. In the case of some loans, NACF has tried to obtain the guarantee of the Government for the repayment of the principal and interest but so far without success.

Loan Operations and Collections

21. There has been a steady expansion of credit provided by NACF and Kun cooperatives since 1965, whether judged by the volume of loans advanced per year or the level of outstanding loans. The proportion of loans for non-agricultural purposes was on the increase in 1969 and 1970, while that for agricultural purposes (especially medium-term loans) was declining (Tables 1 and 2). This appears to have resulted partly from the policy of providing loans for commercial purposes with a view to attracting deposits and partly from limited availability of funds from sources other than Government for on-lending to agriculture.

22. By and large, the arrears position of NACF is manageable (Table 3) though it is difficult to assess the recovery performance as no figure of extended loans is available and a loan could apparently be extended if interest and part of the principal had been paid. There is an active collection drive during the last three months of each calendar year, with targets based on parts of the amounts falling due during the year. Legal action is envisaged for all loans overdue for more than three months but has been resorted to in only a limited number of cases. Available information shows a steady increase in overdues resulting partly from crop failure but the actual increase might have been larger as amounts extended have also been included in the figures of loan recoveries (Table 3).

23. It has been roughly estimated that 84,017 loans of NACF and Kun cooperatives, amounting to W 1,514 million (inclusive of interest arrears), were doubtful of recovery as of the end of 1970. Also feared to be uncollectible was a sum of W 661 million, made up of long-term irrigation loans and the 'usury debt loans' made to farmers for relieving them of the burden of accumulated debts. A grant has been sought from Government for the write-off of these amounts as they were advanced in pursuance of state policies, but NACF has not yet been compensated. The NACF has been writing off bad debts in small amounts by debit to its annual profit and loss accounts as there is no reserve or provision for the purpose.

Non-credit Business of NACF

24. Supply of Farm Inputs and Machinery. NACF is actively engaged in various non-credit activities, the most important of which are the distribution of farm inputs and the marketing of farm produce. Among the farm inputs, the major category is fertilizer distribution for which cooperatives have a monopoly. Though fertilizer consumption, in terms of nutrients, nearly doubled between 1962 and 1970 and continues to grow, the increase in domestic production has been such that NACF, which is required to take over the whole of it, has been forced to accumulate large inventories, financed by credit from the Bank of Korea. Fertilizer stocks reached a level of over 1 million tons in 1969 and declined slightly in the second half of 1970. A second important aspect of the fertilizer business concerns the obligation of the Government of Korea to pay to NACF the difference between (a) the sum of the delivery price paid to the manufacturer and the operating costs as agreed to by Government, and (b) the selling price fixed by Government and charged to the farmer. The allowance for operating costs appears to be insufficient. A sum of W 9,972 million was due to NACF on fertilizer account from Government as of December 31, 1970. Thirdly, fertilizer, which is distributed through 4,000 cooperative depots throughout the country, is sold partly for cash and partly on credit. The period of credit is a few months and the rate of interest is 8.4%. The proportion of credit sales is declining but is still about 32%. Nearly one-fourth of receivables on this account are in arrears. Fertilizer business thus appears to be handicapped by high levels of inventories, inadequate and delayed compensation for costs incurred and overdues on credit sales.

25. NACF and Kun cooperatives also play a major role in the distribution of farm chemicals. Pesticides used for paddy are subsidized and 70% of the sales are on credit. Considerable emphasis is placed on joint or cooperative spray of chemicals for plant protection.

26. Power tillers and power dusters or sprayers are the main items of farm machinery sold by NACF. Apart from being subsidized to the extent of 20% of price for tillers and about 7% for sprayers, these items are supplied on credit. Credit for power tillers carries interest at 9% per annum and is repayable in five years, including two years of grace. Land is taken as security for such credit sales, in addition to the machine itself. Power tillers are manufactured locally by two local firms with about 15% to 30% of the component parts being imported. Sales of power tillers have increased from 175 units in 1963 to 3,581 in 1970, and those of dusters/sprayers, from 1,982 units in 1967 to about 24,000 in 1970.

27. Marketing. Marketing activities of NACF include (a) sales of such general farm products as sweet potato, barley, soyabean and corn; (b) marketing of specialized cash crops, principally silk cocoons and rape seed; (c) sales to U.N. and Korean Military Forces; and (d) sales through cooperative marketing centers. The last of these categories is by far the most important and includes both sales of grains, fruits and vegetables undertaken by the centers on their own through auctions and transactions in grains undertaken on behalf of Government on an agency basis. Particulars of agricultural produce marketed are as follows:

(in W million)

	1968	1969	1970
Sales of general farm produce	2,899	3,132	2,237
Sales of cash crops	7,070	9,036	9,498
Sales to military forces	1,110	1,351	2,808
Sales of cooperative marketing centers:			
(a) As agents of Government	5,091	8,415	9,586
(b) Other	21,715	53,426	53,023
(c) Total	26,806	61,841	62,609

In addition, NACF also markets farm 'sideline' products such as straw goods. In some instances where general farm products and cash crops are marketed, NACF extends credit to the buyers for periods not exceeding one year, charging a rate of interest of 6% for cocoons, 9% on other items used in export preparation (for which special refinancing facilities are available), and 22% in other cases. Such credit sales are considered necessary for expediting sales but the collection of dues has proved difficult. Accounts receivable in marketing business amounted to W 2,914 million for NACF and W 2,513 million for Kun cooperatives at the end of 1970; about 8% of the total was overdue at the NACF level.

28. Mutual Insurance. NACF's activities include life insurance, juvenile insurance (to finance education and marriage of children), and fire and livestock insurance. New policies issued in 1970 numbered 79,234 for endowment, 18,032 for juvenile insurance, 52,030 for livestock insurance and 23,810 for fire insurance. Sizeable surplus funds become available from insurance for financing the other activities of NACF.

29. Other Activities. NACF operates a feed mixing plant. Transportation of agricultural produce and farm supplies is another growing activity of NACF. Further, NACF and Kun cooperatives together account for a substantial part of the agricultural storage available in Korea. NACF has also been providing loans and subsidies to Kun and Ri Dong cooperatives for construction of warehouses. At the end of 1970, there were 5,307 cooperative warehouses, in which 186.6 million bags of grain and 0.6 million tons of fertilizer were stored. NACF also has a program for the construction of about 1,500 warehouses in the next five years at the Myon level (where the reorganized primary cooperatives will have their offices), with loan assistance of about US$6 million from USAID.

30. Guidance. One set of promotional activities of NACF is termed 'guidance' and covers both cooperative education and management and an extension-type of service relating to farming and livestock. The aim of these efforts is to improve the management and working of primary cooperatives by promoting a program of consolidation and operation of the mutual credit scheme, and conduct courses and seminars for the education of members, farmers and local leaders as well as staff of cooperatives (paras 11 and 12). As part of farm guidance activities, projects are undertaken for the increased production of various cash crops and certain exportable commodities. Working closely with the Office for Rural Development (the Government organization for research and extension), NACF seeks to assist farmers, Ri Dong and special cooperatives to take up the cultivation of new crops and adoption of new crop rotation patterns and of new production techniques. NACF provides a substantial subsidy each year to Kun cooperatives to enable them to help farmers participate in such programs. Similarly, it has been supporting special projects for beef cow breeding and dairy farming. Technical staff is employed for these activities and provides farmers with technical guidance as well as financial assistance. Inclusive of amounts spent on information and cooperative education and expenses connected with programs for enabling farmers to improve crop and livestock production, the expenditure on guidance is a major charge on the revenues of NACF and partly accounts for its meagre profits.

Resources

31. The resources of NACF are made up of: (a) borrowings from Government; (b) borrowings from the Bank of Korea; (c) deposits from the public and from the Kun cooperatives; and (d) to a limited extent, share capital

and reserves (W 2,616 million at the end of 1970). The budgetary funds allocated to NACF have been increasing from year to year and the aggregate outstanding dues to Government amounted, at the end of 1970, to W 56,658 million. Deposits including the surplus funds of Kun cooperatives, amounted to W 52,277 million, and borrowings from the Bank of Korea to W 32,673 million.

32. Budgetary funds made available for use as medium-term loans are charged 5% by Government and lent to farmers at 9%. Government has also provided NACF with amounts repayable in 30 years at interest of 2% for making long-term loans to farmers' associations connected with the management of irrigation works. Further, NACF has received Government funds at 2% interest for credit sales of fertilizer and farm chemicals. Government has also supplied resources to NACF for purchase of agricultural produce such as sweet potatos, pepper and silk cocoons as part of a buffer stock operation designed to ensure stable prices for these commodities. Foreign loans include funds received from the U.S. Government through the Government of Korea to be on-lent as irrigation loans and a sum received directly from the Commodity Credit Corporation of USA for being used in the commercial business of NACF. The Bank of Korea has provided three lines of credit to NACF: (a) W 30 billion at an interest rate of 2% for financing fertilizer business: (b) W 9 billion at 5% for production credit to farmers; and (c) about W 8 billion at 5.4% for financing exporters, especially of silk.

33. In mobilizing deposits, cooperatives command the advantage of having offices at more centers than the commercial banks and, further, have introduced certain special farmers' deposit schemes designed to tap rural savings. Moreover, for attracting deposits, NACF and the Kun cooperatives provide "savings promotion loans" which, in the aggregate, may be up to one quarter of the value of deposits received. As a result, the deposits of NACF and Kun cooperatives rose from W 20,948 million in 1966 to W 95,417 million at the end of 1970, of which about one quarter represented farmers' deposits. The target is to raise total cooperative deposits from about W 100,000 million in 1971 to W 200,000 million by the end of 1976.

Financial Position

34. It is difficult to assess NACF's financial position and its operating results precisely in view of the complexity of its functions, the magnitude and the subsidized nature of some of its operations, the close integration of its activities with those of the Kun cooperatives and the lack of adequate data to bring out the impact of these factors on its working (para 38). The available information (summarized in Tables 4, 5, 6 and 7) indicates that NACF's profits have been meager in relation to the volume of its credit and other operations which have been expanding from year to year. This is partly because NACF incurs costs for agricultural extension-type work and also subsidizes Ri Dong and Kun cooperatives.

Additionally, the subsidies promised to NACF by Government do not appear to compensate NACF sufficiently for its costs and have not been promptly paid to it in all cases. Administrative expenses have been rising from year to year with expanding operations and common overheads are allocated to different business sectors in relation to the number of staff and the net income earned by each business after allowing for expenditure other than such common administrative costs. On this rough reckoning, the marketing and purchasing businesses are running at a loss, while credit, insurance and fertilizer distribution have earned profits (Table 7). The Kun cooperatives have also been working at a low profit but have received subsidies from the NACF (Tables 6 and 7).

35. Because of the limited volume of profits, no substantial reserves have been built up by NACF or the Kun cooperatives. There is provision for (a) a legal reserve to which 10% of the net profit is to be carried each year till it is equal to share capital; (b) a reserve for business operation to which another 10% is carried (and which can be used in business); and (c) a capital reserve to which are carried the profits from donated fixed assets, revaluation of assets, and the like. It is the capital reserve that is substantial, thanks to a revaluation of assets authorized under special legislation enacted for this purpose in 1965. The share capital of NACF has remained small, as there is no link between the value of shares held and the amount of borrowing. All borrowers are not required to become shareholders and each member cooperative is required to hold only one share. At the end of December 1970, the capital and reserves of NACF and Kun cooperatives were as follows:

(in W million)

	NACF	Kun Cooperatives
Paid-in capital	492	1,018
Legal reserve	355	311
Reserve for business	82	434
Capital reserve	1,645	3,018
Undistributed profit	42	164
	2,616	4,945

36. Project cash flow is shown in Table 8. Projection of the balance sheet and income and expenditure of the NACF is somewhat difficult. The future dimensions and the distribution of its activities among different businesses depend on its own policies and those of the Government of Korea and the manner in which and the extent to which Government provides subsidies and seeks to hold prices of credit and inputs down. Further, the Project would form only a small part of NACF's total operations. Rough estimates for only the credit section of NACF are, however, given in Tables 9 and 10. On present indications, assuming an increase of the interest rate on medium-term and long-term agricultural loans, the stopping of Government subsidies

and an expansion in credit operations, NACF's profits in credit business may increase slightly but will still remain small in relation to the volume of its operations.

Accounts

37. In terms of the Agricultural Cooperative Law, NACF is required to prepare its business plan and budget for each fiscal year and obtain the approval of the concerned Minister of the Government not later than one month prior to the commencement of the year. The law requires that the Federation shall settle all accounts within two months after the end of each fiscal year and report to the Minister in this regard after the Representative Meeting has approved the business report and the balance sheet, The NACF's own by-laws stipulate that its accounting shall be in the form of comprehensive accounts and be divided into a general account and a credit account, both of which shall be "legally and actually independent" and that transfers between these accounts are prohibited. In pursuance of these provisions and the increasing recognition of the need for a clear presentation of NACF accounts, some steps have been taken or considered in this direction. These include: (a) increased restrictions (in force from March 1970) on the provision of funds by the banking and credit section of the NACF for financing its commercial and other non-credit activities, (b) charging of a rate of interest of 24% by the credit section on advances to other sections, (c) monthly distribution of administrative costs between credit and business (non-credit) sectors, (d) creation of a special office directly under the President of NACF for evaluating the manner in which the administrative expenses are distributed, and (e) establishment of targets for net surpluses for each commercial sector of NACF.

38. Notwithstanding the statutory provisions and the steps proposed or taken, much remains to be done for ensuring a clear presentation of NACF operations. The following are some of the factors contributing to the present lack of clarity:

(a) Some of the proposed measures such as monthly distribution of administrative expenses are not yet in force;

(b) The NACF undertakes various operations on behalf, or at the behest, of Government. In some instances, the provision for compensating the cost or loss to NACF is inadequate and the payments due to NACF on such accounts are sometimes delayed. The accounts do not fully bring out these aspects of NACF's activities;

(c) It is not easy to ascertain the financial position of each business sector or how profitably it is being operated. Though various monthly statements are prepared, the picture is not clear enough to provide a basis for management decisions on pricing and inventories;

(d) The allocation of administrative costs (including guidance expenditure) among different businesses is now based partly on the distribution of staff and partly on the estimated gross income of individual sections. While this is a first step, further refinement is necessary on the basis of cost accounting principles. A detailed analysis is made only once a year and the authoritative break-up of the 1970 data for this purpose was not ready by June 1971; and

(e) Accounts receivable in the business sector are not clearly evaluated to show the overdues and uncollectible amounts.

39. Though the bookkeeping of NACF is satisfactory, the accounting system needs to be improved so as to enable its own management, as well as its creditors, to obtain a clearer picture, especially of the profitability of each of its business sectors. This would be particularly important in the short run for enabling the management to take decisions on measures for correcting deficits and losses in individual sectors and, in the long run, for determining the extent to which and the manner in which credit and other activities of NACF might be progressively separated. Reform of the accounting system assumes further urgency in view of NACF's intention of using the electronic data processing system for the maintenance of its accounts. As the operations of NACF have rapidly expanded, there is a need to ensure that its organization and financial and accounting arrangements are suitably streamlined to meet the requirements of efficient management. As this can be done only on the basis of a careful examination of the present system, a firm of management consultants would be asked to study the existing accounting system of NACF and suggest measures of improvement and help in the implementation of the recommended steps, as set out in the terms of reference given in Annex 7.

Audit

40. As stipulated in the Agricultural Cooperative Law, the General Assembly of NACF elects two auditors to serve for a term of two years; of these, the standing auditor is required to have "an abundant knowledge and experience" of his duties and functions. The auditors' duties have been defined as those of "inspecting and auditing the business and status of assets of the Federation." The law also provides for the exercise of supervisory functions vis-a-vis NACF by the competent Minister (who could

be the Minister of Finance or Minister for Agriculture, depending on whether the credit aspect of the working of NACF is being considered or some other aspect). The minister can also have the Superintendent of Banks, Bank of Korea, inspect and audit the Federation and can delegate part of his supervisory authority to Provincial Governors or the President of NACF. Further, in case a cooperative or the NACF receives subsidies or loans from Government, it is subject to audit, insofar as the use of Government funds is concerned, by the Board of Inspection of the Government of Korea. The Bank of Korea also undertakes an annual statutory inspection of the NACF, looking mainly into the credit and banking aspects of its working. Finally, NACF and its branches are also subject to investigations by the National Assembly Investigation Committees of Finance and of Agriculture and Forestry. Though there are, thus, several agencies involved in supervision and inspection of the NACF, none of these is concerned with all the aspects of its operations. Further, its only comprehensive audit is that conducted by the two auditors elected by the General Assembly, with the assistance of nine assistant auditors who are on the NACF staff.

December 13, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

Outstanding Loans of NACF and Kun Cooperatives by Source of Funds and Purpose
(in million won)

December 31,	1966	1967	1968	1969	1970
From Banking Funds					
I. Agricultural Loans					
a. Short-term - Production	1,642	1,805	3,392	5,175	5,729
b. Medium-term	-	-	4,584	12,321	17,215
c. Short-term Loans to Indsitutions	1,890	2,364	1,961	1,871	5,002
d. Short-term Loans for Collection of Agricultural Produce	1,792	1,697	4,664	6,618	-
e. Other Short-term Agricultural Loans	1,939	2,575	4,618	5,017	9,224
f. Usury Debt Settlement Loans - Medium-term Loans	1,916	1,786	1,682	1,612	1,521
Total Agricultural Loans	9,179	10,227	20,901	32,614	38,691
II. Short-term Fishery Loans	774	1,347	1,919	4,580	4,633
III. Other Short-term Loans					
a. Export Trade Loans	-	-	-	465	4,234
b. General Commercial Loans	1,387	2,509	4,089	8,968	15,090
c. Loans on Term Deposits	314	1,272	3,109	6,732	8,339
Total Other Short-term Loans	1,701	3,781	7,198	16,165	27,663
TOTAL BANKING FUND LOANS	11,654	15,355	30,018	53,359	70,987
From Budgetary Funds					
I. Counterpart Funds					
a. Agricultural Production	2,878	1,939	993	758	9
b. Medium-term Agricultural Loans	-	1,210	1,510	1,310	-
c. Agricultural Modernization	326	317	291	250	1,177
d. Business Loans for Ridong and Special Cooperatives	961	1,042	1,059	1,279	822
Total Counterpart Funds	4,165	4,508	3,853	3,597	2,008
II. Budgetary Operations Fund					
a. Agricultural Production	921	2,381	1,009	3,827	2,940
b. Agricultural Main Production Areas	-	-	2,255	2,313	4,070
c. Agricultural Price Stabilization	-	-	85	1,015	1,931
d. Foreign Loan	-	-	-	4,069	3,791
e. Others	780	991	1,559	4,311	5,789
Total Budgetary Operations Fund	1,701	3,372	4,908	15,535	18,521
III. Pension Fund (Agricultural Production, Roof Improvement, etc.)	71	80	344	240	70
IV. Irrigation Fund					
a. Fixed Term Loan	3,233	3,747	4,802	5,840	1,585
b. Loan in Installments	3,480	4,200	4,770	5,703	12,079
V. Special Accounts	263	205	163	139	109
TOTAL BUDGETARY FUND LOANS	12,913	16,112	18,840	31,054	34,372
GRAND TOTAL	24,567	31,467	48,858	84,413	105,359

August 26, 1971

ANNEX 3
Table 1

K O R E A

AGRICULTURAL CREDIT PROJECT

Purpose-wise Analysis of Loans Granted by NACF and Kun Cooperatives
(in million won)

ANNEX 3
Table 2

	1966	1967	1968	1969	1970
I. Agricultural					
a. Long-term (Irrigation)	1,248	1,917	2,204	6,550	3,616
b. Medium-term					
Farmers' Increased Income Program	-	-	1,479	7,724	5,311
General Crops	1,078	1,871	2,356	3,255	2,259
Sericulture	209	-	395	370	713
Livestock	463	159	1,083	1,692	1,660
Cash Crops	17	-	-	149	394
Disaster Loans	-	-	1,600	1,150	542
Forestry	1	35	95	100	335
Roof Improvement	64	65	78	116	47
c. Short-term					
Production (Cultivators)	3,895	5,110	6,613	11,864	7,455
Agricultural Enterprises	622	1,828	5,320	4,661	10,688
Agricultural Associations	6,449	11,489	12,424	12,730	7,152
Rice Lien Loans	1,965	1,589	1,069	134	-
II. Fostering of Coops.					
a. Ri-dong Cooperatives	370	351	546	1,200	2,263
b. Special Cooperatives	526	491	1,061	683	1,056
III. Ag. Marketing					
a. Produce Collection Loans	-	-	85	2,072	1,861
b. Feed Price Stabilization	-	380	520	2,003	960
IV. Export Financing					
a. Export Preparation	-	-		2,448	12,296
b. Foreign Trade	-	-	-	508	10,207
V. Fishery Loans (Short-term and Medium-term)	1,422	2,141	8,843	13,823	15,570
VI. General Commercial Loans	11,254	22,931	52,167	78,741	100,284
TOTAL	29,583	50,357	97,938	151,973	184,669

August 26, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

Collections and Overdues of NACF and Kun Cooperatives
(in million won)

	N A C F 1/			Kun Cooperatives			NACF AND Kun Cooperatives		
	1968	1969	1970	1968	1969	1970	1968	1969	1970
1. Loans outstanding at the beginning of the year	15,683	21,210	35,901	15,784	27,648	48,512	31,467	48,858	84,413
2. Loans advanced during the year 2/	31,347	49,417	67,180	66,491	102,556	117,489	97,838	151,973	184,669
3. Loans recovered during the year 2/	25,820	34,726	63,988	54,627	81,692	99,734	80,447	116,418	163,722
4. Loans outstanding at the end of the year	21,210	35,901	39,093	27,648	48,512	66,267	48,858	84,413	105,360
5. Loans overdue at the end of the year	2,187	2,654	2,004	3,858	5,071	7,348	6,045	7,725	9,352
6. Proportion of 5 to 4	10.3	7.4	5.1	14.0	10.5	11.1	12.4	9.2	8.9

1/ Figures exclude loans for supporting Kun Cooperatives and their business.

2/ Figures include amounts extended during the year.

ANNEX 3
Table 3

September 23, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

Condensed Balance Sheet of NACF
(in million won)

A S S E T S					
End of	1966	1967	1968	1969	1970
CREDIT AND BANKING					
Cash	567	1,124	2,010	1,352	2,702
Deposit in Bank	6,569	6,985	2,485	7,260	8,760
Securities	38	37	37	3,838	52
Loans to Kun Cooperatives	10,539	11,267	18,099	30,919	42,356
Loans to Individuals:					
a) From Banking Funds	6,927	8,968	13,186	19,520	16,540
b) From Budgetary Funds	8,018	9,647	11,989	15,774	18,916
c) From Foreign Funds	-	-	-	3,925	3,638
Miscellaneous Claims	2,234	3,680	4,364	5,607	8,262
Inter-office Accounts	-	3,058	-	-	-
Sub-total	34,892	44,766	52,170	88,195	101,226
MUTUAL INSURANCE					
Deposit	801	1,140	2,714	2,579	1,945
Loans	-	175	706	1,273	2,029
Fixed and Other Assets	-	95	158	676	1,530
Sub-total	801	1,410	3,578	4,528	5,504
BUSINESS					
Receivables and Advance Payments	10,595	16,746	17,909	19,986	19,700
Inventory	12,883	10,156	20,332	26,141	22,741
Fixed Assets	625	708	967	1,578	3,116
Miscellaneous Assets	1,358	2,512	5,015	11,064	17,083
Sub-total	25,461	30,122	44,223	58,769	62,640
Total Assets	61,154	73,298	99,971	151,492	169,370

L I A B I L I T I E S					
Enf of	1966	1967	1968	1969	1970
CREDIT AND BANKING					
Deposits:					
a) From Kun Cooperatives	8,764	13,404	11,457	14,829	18,475
b) From Public	7,674	5,126	5,902	6,922	7,402
Borrowings:					
a) From Bank of Korea;					
i) for agricultural credit	2,126	4,102	2,447	1,377	2,673
ii) for fertilizer business	18,500	20,100	27,900	32,000	30,000
b) From Government of Korea	17,557	19,228	23,584	40,655	48,541
Foreign Loans	-	-	-	5,752	8,117
Agricultural Credit Debentures	465	223	166	121	83
Inter-office Accounts	-	-	12,977	27,918	26,407
Miscellaneous Liabilities	1,763	5,364	3,200	3,649	4,866
Sub-total	56,849	67,547	87,633	133,223	146,564
MUTUAL INSURANCE					
Reserves and Other Liabilities	832	1,955	3,587	6,158	9,409
BUSINESS					
Accounts Payable and Advance Receipts	1,316	1,359	6,275	8,376	6,518
Other Liabilities	1,196	1,460	1,362	2,568	4,199
Sub-total	2,512	2,819	7,637	10,944	10,717
CAPITAL AND RESERVES					
Paid-in Capital	439	464	446	474	492
Reserves (including undistributed profit)	488	494	620	639	2,125
Sub-total	927	938	1,066	1,113	2,617
Net Profit for the Year	34	39	48	54	63
Total Liabilities	61,154	73,298	99,971	151,492	169,370

ANNEX 3
Table 4

August 26, 1971

K O R E A

ACRICULTURAL CREDIT PROJECT

Consolidated Balance Sheet of Kun (County) Cooperatives
(in million won)

Assets	1966	1967	1968	1969	1970
CREDIT AND BANKING					
Cash and Deposit with Banks	11,805	18,323	17,654	22,026	30,247
Loans: a) From Banking Funds	5,352	7,511	19,106	35,504	52,928
b) From Budgetary Funds	4,895	6,465	6,851	11,211	11,665
c) From Funds Raised Temporary Debentures	1,916	1,786	1,682	1,612	1,521
d) Others	7,278	8,721	10,340	11,932	13,131
Total Loans	19,441	24,483	37,979	60,289	79,245
Miscellaneous Assets	1,015	1,646	1,886	1,885	2,113
Inter-office Accounts	-	-	12,874	27,415	26,762
Sub-Total	32,261	44,452	70,393	111,615	138,367
Other Business					
Accounts Receivable and Advance Payments	5,818	9,349	13,010	14,007	14,524
Inventory	10,531	9,433	19,206	21,856	21,629
Fixed Assets	2,169	2,430	2,937	3,676	7,360
Other Assets	2,722	1,818	2,757	3,488	6,573
Sub-Total	21,240	23,030	37,910	43,027	50,086
Total Assets	53,501	67,482	108,303	154,642	188,453

Liabilities	1966	1967	1968	1969	1970
CREDIT AND BANKING					
Deposits	13,274	22,647	40,881	68,979	88,015
Borrowings	13,204	14,302	22,068	34,326	42,681
Miscellaneous Liabilities	7,629	8,920	11,327	13,569	15,505
Inter-office Assets	488	1,483	-	-	-
Sub Total	34,595	47,352	74,276	116,874	146,201
Other Business					
Accounts Payable and Advance Receipts	16,347	17,042	29,976	32,387	30,815
Miscellaneous Liabilities	1,261	1,672	2,527	3,684	6,264
Sub Total	17,608	18,714	32,503	36,071	37,079
Paid-in Capital	583	631	715	824	1,060
Reserves Including Undistributed Profit	608	712	747	804	3,885
Capital and Reserves	1,191	1,343	1,462	1,628	4,945
Net Profit for the Year	107	73	62	69	228
Total Liabilities and Capital	53,501	67,482	108,303	154,642	188,453

ANNEX 3
Table 5

August 26, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

Income and Expenditure of NACF and Kun Cooperatives
(in million won)

	NACF				Kun Cooperatives			
	1967	1968	1969	1970	1967	1968	1969	1970
Income								
Interest	3,777	6,065	10,740	11,666	5,692	8,464	12,655	17,037
Profit on Sales	3,427	3,147	2,321	914	485	602	649	639
Earned Commission	258	465	58	134	522	602	4,747	5,220
Income from Mutual Insurance	2,113	3,987	6,837	10,415	1,658	2,319	3,561	5,388
Other Income	1,753	2,211	4,357	7,303	1,530	2,109	25	10
Total	11,328	15,875	24,313	30,432	9,887	14,096	21,638	28,294
Direct Expenditure								
Interest Payment	3,512	5,488	10,028	9,838	2,361	4,118	8,339	12,769
Direct Cost of Business Operation	4,643	4,930	5,728	8,486	2,002	2,602	3,617	3,324
Expenditure on Mutual Insurance	1,891	3,758	6,510	9,926	1,453	2,005	3,220	5,000
Total	10,046	14,176	22,266	28,250	5,816	8,725	15,176	21,093
Gross Profit	1,282	1,699	2,047	2,182	4,071	5,371	6,462	7,201
Less Overhead Expenditures								
Wages and Salaries	661	921	1,287	1,373	2,499	3,310	4,561	4,736
Travel Expenses	64	78	97	98	303	333	474	440
Office Supply Expenses	160	204	243	202	558	741	853	841
Entertainment Expenses	42	40	68	76	157	181	208	274
Tax and Public Expenses	54	78	97	101	65	71	83	111
Maintenance Expenses	65	82	105	177	175	219	280	472
Depreciation of Fixed Assets	6	30	34	77	10	11	11	107
Total	1,052	1,433	1,931	2,104	3,767	4,866	6,470	6,981
Net Profit on Business	230	266	116	78	304	505	(8)	220
Subsidies to Cooperatives and Write-offs	141	138	100	-	6	122	19	-
Expenses Other Than Business	50	80	14	71	225	321	-	369
Income Other Than Business	-	-	54	56	-	-	95	377
Net Profit for the Period	39	48	56	63	73	62	68	228
Profit Carried Over	10	10	13	14	74	65	40	122
Accumulated Profit at the End of the Year	49	58	69	77	147	127	108	350

ANNEX 3
Table 6

August 26, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

Income and Expenditure of NACF and Kun Cooperatives by Sector - 1970

(in million won)

	INCOME (EXPENDITURE) FROM BUSINESS			ADMINISTRATIVE EXPENDITURE									NET PROFIT (LOSS)		
	Net of Expenses Other than Administration			Direct Administrative Cost			Share of Common Administrative Cost			Total					
	NACF	Kun Coops	NACF and Kun Coops	NACF	Kun Coops	NACF and Kun Coops	NACF	Kun Coops	NACF and Kun Coops	NACF	Kun Coops	NACF and Kun Coops	NACF	Kun Coops	NACF and Kun Coops
Credit	2,006	4,822	6,828	420	3,212	3,632	719	1,480	2,199	1,139	4,692	5,831	866	131	997
Fertilizer	535	1,064	1,599	66	544	610	188	290	478	254	834	1,088	281	230	511
Purchasing	(392)	528	135	82	356	438	47	164	211	130	520	650	(521)	7	(514)
Marketing	189	237	425	360	259	618	325	94	419	685	353	1,037	(496)	(116)	(612)
Warehousing and Processing	-	198	199	4	181	185	2	71	73	6	252	258	(5)	(54)	(59)
Insurance	489	388	877	117	411	528	200	155	355	316	567	883	173	(179)	(6)
Others	74	81	155	29	71	98	34	26	61	63	96	160	11	(15)	(4)
Total	2,901	7,318	10,219	1,077	5,034	6,111	1,516	2,280	3,796	2,593[a/]	7,314[a/]	9,907[a/]	308	4	312
NACF's Compensation to Kun and Special Cooperatives													(245)	224	(21)
Net Profit													63	228	291

a/ Made up of Expenditure on "Guidance" and Administration as follows:

	NACF	Kun Cooperatives	NACF and Kun Cooperatives
Guidance	468	332	801
Administration	2,125	6,982	9,106
	2,593	7,314	9,907

N.B. 1. Constituent items may not add up to the totals because of rounding.

2. Income and expenditure are presented in this table in a form different from that in table 6.

October 22, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

Project Cash Flow
(in million won)

	1972/3	1973/4	1974/5	1975/6	1976/7	1977/8	1978/9	1979/80	1980/1	1981/2	1982/3	1983/4	1984/5	1985/6	1986/7	Total
INFLOW																
IDA CREDIT (received through Government in the form of contribution to Special Fund)	300	1,100	1,485	1,000												3,885
Government contribution from its own resources	600	600	350													1,550
Repayment of principal and interest payments by sub-borrowers (at 12%) 1/	67	266	556	824	1,005	1,149	1,145	1,111	1,062	892	545	379	192	97	14	9,304
Total Inflow	967	1,966	2,391	1,824	1,005	1,149	1,145	1,111	1,062	892	545	379	192	97	14	14,739
OUTFLOW																
Loans to sub-borrowers	872	1,700	2,070	543												5,185
Interest on balance in the Fund (at 7%)	-	100	242	357	377	376	375	374	373	372	371	370	370	370	370	4,797
Administration costs 2/	52	139	233	219	173	146	117	89	60	35	19	9	3	1	1	1,296
Total Outflow	924	1,939	2,545	1,119	550	522	492	463	433	407	390	379	373	371	371	11,278
Surplus (Deficit) - Annual	43	27	(154)	705	455	627	653	648	629	485	155	-	(181)	(274)	(357)	3,461
Surplus (Deficit) - Cummulative	43	70	(84)	621	1,076	1,703	2,356	3,004	3,633	4,118	4,273	4,273	4,092	3,818	3,461	

N. B. For the purposes of this statement, NACF and Kun cooperatives have been treated as one unit.

1/ Including interest on amounts advanced from mechanization fund at 9%.
2/ Administration costs at 4.5% up to 1975 and 4/ thereafter (including cost of technical assistance and training financed under the project) and provision for bad debts at 1.5% of outstanding loans.

April 19, 1972

ANNEX 3
Table 8

K O R E A

AGRICULTURAL CREDIT PROJECT

PROJECTED INCOME AND EXPENDITURE OF CREDIT SECTION OF NACF 1/
(in W million)

	1970	1971	1972	1973	1974	1975
INCOME						
Interest on loans	-	9,900	12,500	14,000	15,800	17,500
Interest on deposits	-	90	100	110	130	140
Interest on advances to other sections	-	1,700	1,900	2,450	2,800	3,250
Total Income	11,666	11,690	14,500	16,560	18,730	20,890
EXPENDITURE						
Interest paid on deposits (including the surplus funds of Kun Cooperatives)	-	6,400	7,700	8,900	9,800	10,800
Interest on borrowings from Government (including interest on funds provided by Government for project)	-	1,840	2,100	2,300	2,650	2,800
Interest on borrowings from Bank of Korea	-	550	600	700	750	800
Interest on foreign funds	-	450	600	650	900	1,200
Provision for bad debts	-	500	600	600	650	650
Administrative expenses	-	2,000	2,400	2,800	3,250	3,650
Total Expenditure	10,800	11,740	14,000	15,950	18,000	19,900
Excess of Income over Expenditure	866	(50)	500	610	730	990

1/ The income figure for 1970 includes Government subsidies but projections for later years do not.

Projections assume:

1) 80% of agricultural loans advanced through Kun cooperatives and 20% made direct.

2) Interest earned
   - on short-term agricultural loans (a) through Kun cooperatives - 8%
     (b) made direct - 12%
   - on medium-term agricultural loans made under the project (a) through Kun cooperatives - 9%
     (b) made direct - 12%
   - on other medium-term agricultural loans (a) through Kun cooperatives - 6.6%
     (b) made direct - 9%
   - on irrigation loans - 3½%
   - on loans to cooperatives and associations, non-agricultural loans and advances to other sections - 22%

3) Interest paid on deposits on average at 12%.

4) Interest paid on borrowings from Government and Bank of Korea and foreign funds at 5%.

5) Administrative expenses at 2.2% of outstanding loans.

6) Provision for bad debts on an ad hoc basis to reach about 2% of portfolio in 1975.

April 20, 1972

K O R E A

AGRICULTURAL CREDIT PROJECT

Projected Assets and Liabilities of Credit Section of NACF
(in million won)

	1970	1971	1972	1973	1974	1975
ASSETS						
Cash and Deposits with Banks	11,610	14,000	15,000	16,000	17,000	18,000
Loans						
Short-term Agriculture	17,200	20,000	24,000	29,000	33,000	36,000
Medium and Long-term Agriculture 1/	25,445	30,000	36,000	43,000	52,000	60,000
Special Irrigation loans (Long-term)	10,100	12,000	13,000	14,000	15,000	16,000
Loans to cooperatives and associations	4,300	5,000	6,000	8,000	10,000	12,000
Non-Agricultural loans	20,400	25,000	30,000	32,000	34,000	36,000
Sub-total	77,445	92,000	109,000	126,000	144,000	160,000
Advances to other sections (Net)	12,641	9,000	9,000	12,000	14,000	15,000
Fixed Assets	3,116	5,000	5,000	6,000	6,000	7,000
Total Assets	104,812	120,000	138,000	160,000	181,000	200,000
LIABILITIES						
Deposits	22,365	25,000	30,000	33,000	36,000	40,000
Borrowing from Bank of Korea	10,459	10,000	12,000	14,000	16,000	18,000
Borrowing from Government	34,785	40,000	42,000	46,000	50,000	52,000
Borrowing from Foreign Funds	8,117	9,000	10,500	15,000	21,000	25,000
Surplus Funds of Kun Cooperatives and Miscellaneous Liabilities	26,470	33,200	40,000	46,000	50,000	54,000
Special Fund for Medium and Long-term Agricultural loans			200	1,800	3,000	5,000
Capital						
Share Capital	492	600	800	1,400	2,000	2,800
Reserves and undistributed profits, including net profit for the year	2,124	2,200	2,500	2,800	3,000	3,200
Total Liabilities	104,812	120,000	138,000	160,000	181,000	200,000

1/ Inclusive of loans under proposed IDA project.

Note: Resource projections are roughly based on NACF estimates, which assume (a) growth in its own deposits on past actual average and that of Kun cooperatives on their similar estimates, (b) increase in borrowings from Government of Korea on national five year plan data, and (c) increase in borrowings from Bank of Korea on its projections. Increased share capital is estimated on the basis of progressive linking of shareholding and borrowings. Aggregate loan portfolio estimates are based on NACF projections. For their break-up, annual increase is assumed at i) 20% in 1972 and 1973 and 15% in 1974 and 1975 for short-term agricultural loans, ii) 20% in 1972, 1973 and 1974, and 15% in 1975 for term loans for agriculture, iii) W 1,000 million for irrigation loans, iv) W 2,000 million for loans to cooperatives and associations, and v) W 2,000 million for non-agricultural loans.

April 20, 1972

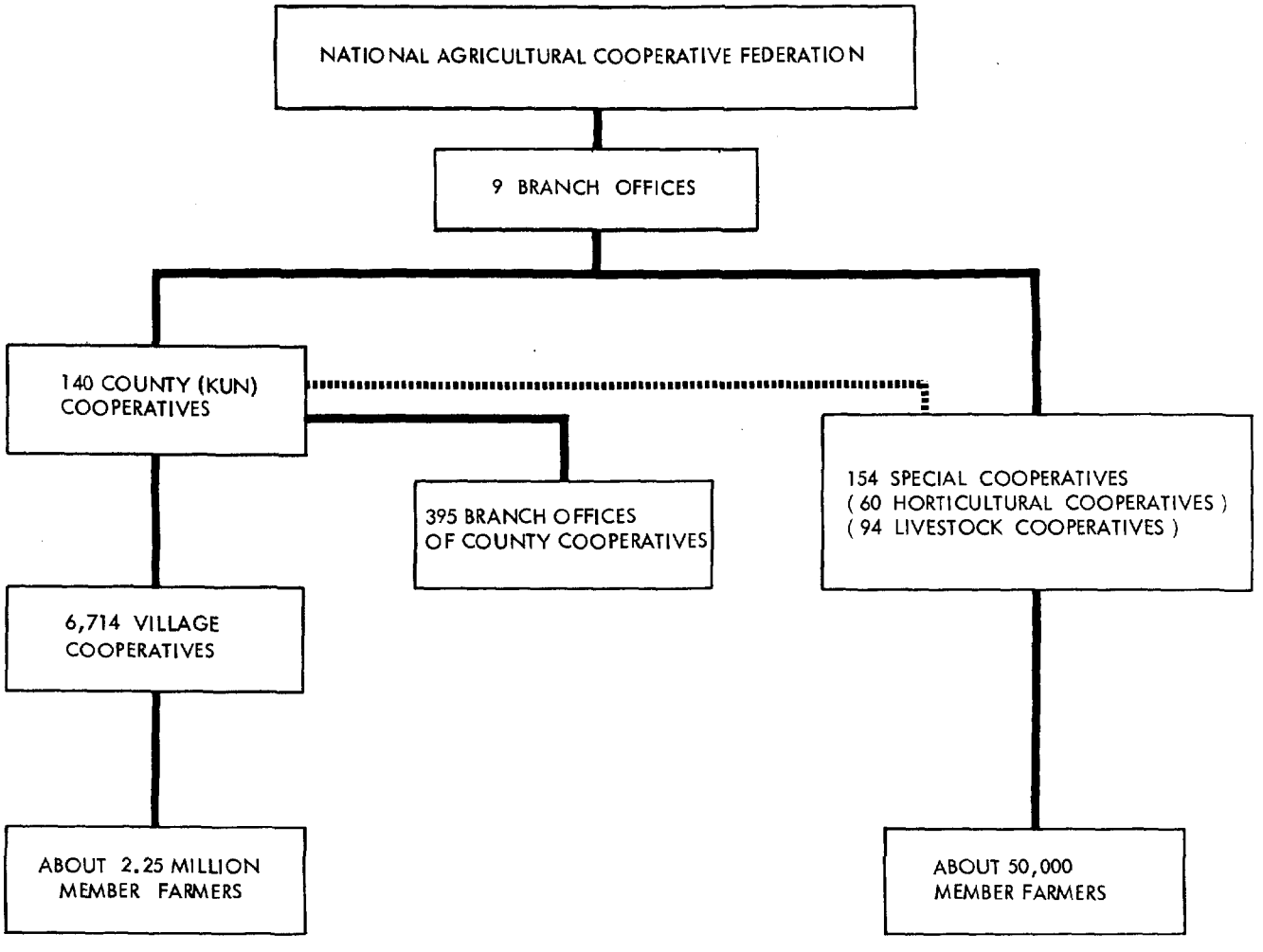
ANNEX 3

CHART 1

KOREA

AGRICULTURAL CREDIT PROJECT

ORGANIZATIONAL STRUCTURE OF THE AGRICULTURAL COOPERATIVES IN KOREA

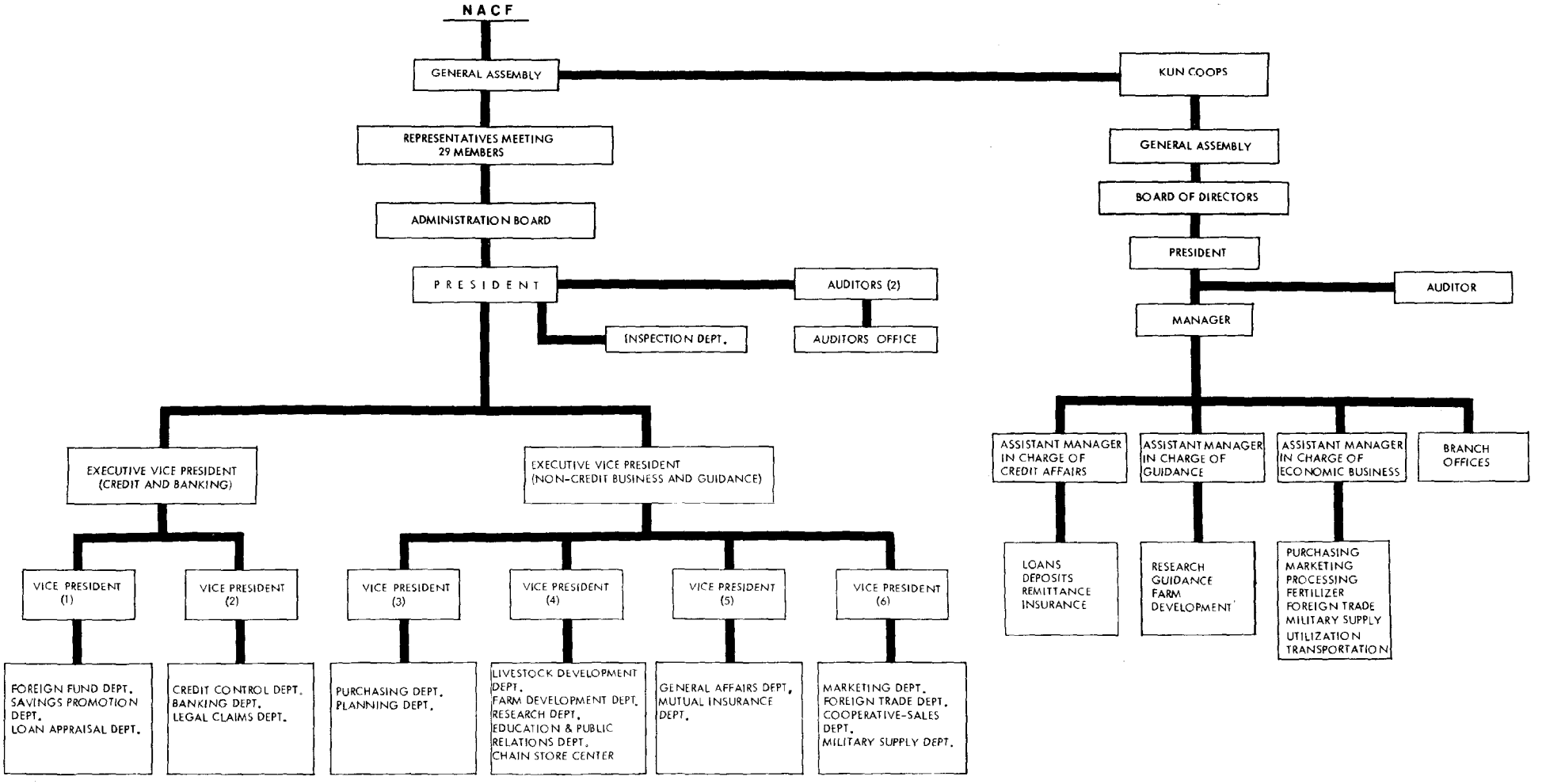


December 13, 1971

World Bank-6088(R)

KOREA AGRICULTURAL CREDIT PROJECT

ORGANIZATION OF NACF AND KUN COOPERATIVES



December 13, 1971

World Bank-6087(R)

ANNEX 3
CHART 2

KOREA

AGRICULTURAL CREDIT PROJECT

Guidelines for Project Coordinating Committee

Objectives

1. The principal objective is to ensure coordinated planning and execution of Project operations within and between NACF and other Government agencies.

Composition

2. The Committee will be constituted under the chairmanship of the Executive Vice President of the Federation and shall include representatives of the Federation, Ministry of Agriculture and Forestry, Office of Rural Development, EPB, Ministry of Finance, and Agricultural Development Corporation, with the Project Manager as its Secretary and the Farm Management Expert as the Adviser.

Responsibilities

3. The committee would have the following responsibilities:

(a) coordinate specific Project investments, viz. orchard, sericulture, livestock and mushroom development, with overall priorities and with related Government programs;

(b) assure cooperation of administrative and technical extension staff of Ministry of Agriculture and ADC at headquarters, Province, and Kun levels;

(c) review progress, identify difficulties and recommend measures to remove obstacles to Project execution; and

(d) plan and implement procedures for evaluating progress of Project investments and their impact on the Korean economy.

Meetings

4. The Chairman or his deputy would convene the committee at least once every three months; the first meeting would be held within one month of Project effectiveness. The Secretary would be responsible for preparation and timely distribution of the agenda and would keep minutes and assure appropriate follow-up.

Establishment

5. The Project Coordinating Committee, its responsibilities and powers would be duly established as a condition of effectiveness of the IDA Credit.

April 28, 1972

KOREA

AGRICULTURAL CREDIT PROJECT

Draft Policy Statement for Operations on the Special Fund for Medium- and Long-term Agricultural Loans to be established in NACF

Resources in the Fund

1. The resources in the Fund would consist of: (a) a sum of W 1,400 million lent to NACF by Government of Korea, at an interest rate of 7% (b) the proceeds of IDA credit to be passed on by Government to NACF in the same manner; and (c) amounts received by way of repayment of loans made from the resources in the Fund.

Use of Resources in the Fund

2. The resources in the Special Fund for medium- and long-term loans for agricultural purposes (to be referred to hereinafter as the Fund) shall be used by NACF for making medium-term and long-term loans for financing the development of orchards, sericulture, mushroom, poultry and swine.

3. All recoveries made in respect of loans disbursed from this Fund shall be credited to the Fund and used for further lending for approved purposes. The interest paid on resources in the Fund and that earned on the loans shall be carried to the profit and loss account of the credit sections of NACF and Kun cooperatives.

4. NACF shall maintain separate accounts of operations on the Fund.

Eligible Purposes

5. The list of purposes for which loans may be made may be expanded to cover other purposes similar to those specified in paragraph 1 above after the disbursements under the IDA Project are completed.

Eligible Categories of Borrowers

6. Loans from the Fund may be made to individual cultivators or cooperatives or agricultural associations but the borrowing unit or enterprise should be financially viable and its projected operations should be consistent with the national economic development priorities.

Size of Loans

7. No single loan from the Fund shall ordinarily exceed W 50 million. A loan to any beneficiary shall not exceed 80% of the cost of the investment proposed by him.

Security

8. NACF or Kun cooperatives should obtain adequate security on loans made. However, apart from security considerations, loan requests should be evaluated in terms of the projected incremental returns from the additional investment to be financed and the resulting repaying capacity.

Lending Principles

9. NACF and Kun cooperatives should aim at financing from the Fund only sound projects that are found, on careful appraisal (including field investigation), to be technically feasible, financially viable and can be expected to be satisfactorily managed.

10. The period of repayment of loans shall be based on the life of the asset or development financed and on realistic projections of the borrower's cash flow.

11. Loans from the Fund would not ordinarily be used for refinancing investments already financed from other sources.

12. While providing medium-term and long-term agricultural loans for financing investment expenditures, NACF and Kun cooperatives will finance working capital requirements of the borrower from resources other than those in the Fund or ensure that adequate funds are otherwise available to the borrower for the purpose.

Recovery of Loans

13. Records shall be kept to determine the loan instalments falling due for repayment and to watch the progress of collections.

14. A standard procedure and principles will be adopted for extending the period of repayment of loans.

Rate of Interest

15. The interest rate and any other fees charged to the borrowers of loans from the Fund should be fixed from time to time in the light of the current market rate; the cost of the resources to NACF and Kun cooperatives, and their operating expenses, including adequate provision for bad debts, depreciation and taxes.

Channel for Lending

16. Loans from the Fund shall be advanced to borrowers, as far as possible, through Kun cooperatives, provided, however, that each such cooperative shall satisfy the following conditions:

(a) the real value of the assets of the Kun cooperative is sufficient to meet its outside liabilities and that no part of its capital and reserves has been eroded;

(b) the overdues of the Kun cooperative, at the end of the preceding financial year, do not exceed 10% of its outstanding loans;

(c) the Kun cooperative has adopted a standard procedure and principles for extending the period of repayment of the loans; and

(d) the management of the Kun cooperative is satisfactory and its appraisal staff have been suitably trained for Project lending and supervision or will be so trained within 12 months from the date of the credit.

17. In instances where, for any reason, a loan from the Fund cannot be advanced to a borrower through a Kun cooperative, NACF shall make a direct loan to him and use the Kun cooperative, where necessary, as an agency for lending, on the payment of a commission.

December 13, 1971

ANNEX 6

KOREA

AGRICULTURAL CREDIT PROJECT

Terms of Reference for Farm Management Expert

Post Title:	Farm Management Expert: Adviser to Project Manager
Employer:	National Agricultural Cooperative Federation (NACF)
Duty Station:	Seoul Korea
Duration:	Two years
Duties:	(a) develop model farm plans and plan loan appraisal and supervision (b) prepare training materials and instruction manuals on all essential aspects of loan administration; (c) assist Project Manager in organizing and conducting special courses for loan appraisers; (d) advise and assist Project Manager and Technical Unit staff on all aspects of Project administration; (e) develop plans for evaluating the impact of Project investments on farm production and incomes and on the overall economy; and (f) advise management on defining the priorities and improving the efficiency of its overall lending program.
Qualifications:	Farm management specialist with experience in development banking and in training of loan appraisal staff.
Language:	English essential. Previous exposure to oriental languages desirable, but not required.

December 13, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

Draft Terms of Reference for Management Consultants' Study of the Organization and Accounts of NACF

Objective

1. The objective of the Consultants' Study is to suggest such changes in the accounting system, operational procedures, and organization of NACF as would enable NACF management to:

(a) obtain a sound and detailed statement of the assets and liabilities and the profit and loss position in regard to each of the activities undertaken by NACF generally and credit in particular;

(b) on that basis, to define and follow appropriate policies in regard to matters such as lending, recovery of loans, purchases, sales, pricing, inventories and personnel; and

(c) determine what changes are required in its organizational set-up and operating procedures to deal more effectively with the affiliated cooperatives and other borrowers.

NACF's Major Activities

2. The main categories of activities to be separately studied are:

(a) credit;

(b) fertilizer distribution;

(c) distribution of other farm supplies;

(d) marketing and processing of agricultural produce;

(e) transportation and storage of agricultural produce;

(f) mutual insurance; and

(g) agricultural extension, cooperative education and training and any other activities referred to in NACF as "guidance".

Of these, credit should receive special attention and be dealt with in greater detail than other activities.

Responsibilities of the Consultants' Team

3. The Consultants' Team shall:

(a) review the overall organization of NACF and Kun cooperatives with particular emphasis on accounting and install a cost accounting system for the Federation's accounts;

(b) review lending, procurement and marketing methods and procedures;

(c) recommend measures

(i) to determine a sound and accurate presentation of the profitability and financial position of each of the various activities carried on by NACF and Kun cooperatives, on the basis of an accounts plan for each cost center;

(ii) to ensure that detailed and adequate management information is readily available on all aspects of NACF's working, more particularly in regard to the liquidity position, loan extensions and collections, purchases, sales and inventories;

(iii) to strengthen the Federation's staff by suitable arrangements for recruitment and training;

(iv) to improve the profitability and financial position of NACF and Kun cooperatives;

(v) to improve the organizational set-up of NACF, including accounting, internal control and audit; and

(vi) to separate credit progressively from other activities of NACF, through such structural and other changes in NACF as may be necessary; and

(d) assist the management and staff of NACF in planning and putting into operation the program of reorganization to be determined by NACF, in consultation with IDA, on the basis of the measures recommended by the team.

Work Procedure

4. The Consultants' Team, after initial discussion with NACF management, will decide the method and procedure for conducting its study and shall, as necessary, visit branches of NACF, Kun cooperatives, special cooperatives, and Ri Dong cooperatives, and meet with officials of Government of Korea, Bank of Korea and other banks, representatives of cooperatives and farmers' organizations, individual farmers and any other knowledgeable or interested persons.

Time Schedule

5. The Consultants' Team shall complete the work indicated in Sections (a), (b) and (c) in paragraph 3 within eight months of appointment and the entire assignment within 18 months of appointment.

Key Personnel

6. It is likely that the Consultants' Team will need to include a cost accountant, a financial analyst and a business management specialist. These experts who would be internationally recruited would be assisted by such other staff as can be locally recruited.

Essential qualifications of the experts would be:

(a) Financial Analyst. Project leader, responsible for organizing and implementing the study with a view to mobilizing Korean expertise in conjunction with his own work and that of the other experts. He should be familiar with appropriate methods of systems analysis and should have experience in banking (preferably agricultural credit), business administration and management.

(b) Cost Accountant. Responsible for recommending improved organization and procedures for an accounting system that would provide the information required for policy and management decisions. He should be experienced in cost accounting in respect of banking and business operations.

(c) Business Management Expert. Responsible for recommending reorganization and management procedures with a view to improving the efficiency and financial results of the principal activities carried out by NACF and Kun cooperatives. He should be experienced in administration, analysis and management of agricultural credit and supply organizations, and also in personnel administration and training.

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Orchards

Production

1. Area of fruit orchards represented only about 2% of ROK's cultivated land in 1969, but accounted for about 3.1% of the agricultural GDP. Area and production of fruits have increased markedly:

	1965			1969		
	Area '000 ha	Production '000 tons	Yield kg/ha	Area '000 ha	Production '000 tons	Yield Kg/ha
Apples	19.0	166.8	8,780	20.8	219.4	10,550
Grapes	3.5	18.6	5,310	5.2	37.4	7,190
Pears	5.2	39.5	7,600	6.2	46.0	7,420
Peaches	10.6	54.3	5,120	11.6	68.3	5,890
Other Stone Fruit	1.3	6.2	-	2.9	9.0	-
Other Fruits	3.3	24.6	-	9.0	36.9	-
Total	42.9	310.0	-	55.7	417.0	-

2. Regional distribution of production by type of fruit shows concentration of: (a) apples in North Kyongsang and South Chungchong; (b) grapes in Kyonggido-Seoul; (c) pears in Kyonggido and South Chungchong; and (d) peaches and other stone fruits in South Chungchong, Kyonggido and North Kyongsang.

Production Methods

3. Sharper gains in production were achieved by expanding cropped areas rather than by increasing yields. National average yields are low; however, an estimated 40% of trees are young in non-bearing stage. In areas selected for the proposed Project, yields as high as 25 tons per ha (apples and pears) and 20 tons per ha (peaches, other stone fruits and grapes) are reported. Generally, standards in production techniques and management are good, although the reinforcement of some agronomic techniques such as the use of improved planting material (especially pears); more discipline in population density (especially in grapes), irrigation and drainage; and more careful selection of land (avoiding proximity to wet lands) could lead to gains in productivity. Sizeable gains in production and productivity, which need to be extended, are being achieved by planting improved

varieties on bench-terraced uplands, avoiding competition with the scarce paddy-land; reinforcing crop diversification endeavors; and bringing into production areas not otherwise utilized.

Institutional Support

4. Government, private enterprise, bilateral and international organizations have supported fruit development. In addition to the Office of Rural Development (ORD), the main official experimental station at Suwon, Government supports research institutes and rural guidance agencies at national, provincial and county levels, including the cooperatives; all of them are providing supporting services to fruit production. Private enterprise is mostly engaged in production and multiplication of saplings and improved seedlings. Bilateral and international agencies have provided assistance through surveys, demonstrations and loans.

5. Growers, working with the National Agricultural Cooperative Federation, have organized about 60 horticultural cooperatives in major fruit-growing regions to support fruit and vegetable development. These cooperatives publish and distribute technical and economic information; organize the feedback of growers' problems to technical and administrative authorities; orient, guide and encourage production research; and represent the interests of regional producers or of the entire industry.

Marketing

6. Marketing and processing services are provided to growers by (a) private traders, (b) companies, (c) groups of farmers who own and operate cold storage and/or processing installations, and (d) horticultural cooperatives.

7. The greater part (60%) of the total fruit output (60%) is sold through private traders and retailed in urban markets. In many cases fruit merchants make cash advances to growers before harvest and purchase the crop on the trees. Fruit sold through cooperatives is marketed locally or through the NACF marketing centers established in five main cities (Seoul, Pusan, Taegu, Kyongju and Taejou). At these centers, fruit and vegetables are sold by auction to accredited merchants, and NACF charges a commission of 7%, including a 5% service charge, 1% towards dealers' share capital and a 1% credited to the growers' share capital. A sketch of the marketing channels is shown below:

Markets in the Area

Producer	Collector or Trader in the Production Area	Wholesale Private Markets	Retail Dealers	Consumers
	Agriculture Cooperative	Agri-Cooperatives Marketing Centers	Designated Dealers	

8. The bulk of production (about 90%) is sold in the domestic market in fresh or processed form. The processing rate and the number of processing plants in 1969 were as follows:

	Share Processed %	Number of Plants
Apples	1.0	23
Grapes	12.0	40
Peaches	7.0	51
Pears	14.0	6

In general, the processing units are small enterprises, with limited equipment, but able to adapt to a range of different fruits and vegetables, including mushrooms. A larger plant, the Hankuk Suntory Ltd., in partnership with the Suntory Liquor Company of Japan, has been established to expand production of wine, brandy and other grape products. The winery processed 800 tons in 1969.

9. Market prospects for the incremental Project output of the four fruits are considered favorable and this was one of the principal reasons they were selected for special financing arrangements under the Project. Such output would be disposed of predominantly in domestic markets, which are showing a strong growth with the rising standard of living in Korea. Its magnitude would be marginal in terms of the projected national consumption at the time of full development (Table 1):

Apples	Grapes	Peaches	Pears
4%	15%	9%	11%

The higher level of grapes in the total demand projections conforms with Government policy to expand rapidly the consumption of grape wine in place of rice wine in order to save more rice for food. On the other hand, the existing domestic demand for grape products is substantial already. The income elasticity of demand for grapes was 0.66% in 1968.

10. The sustained and steady increase of fruit prices, compared to the price of other farm products, confirms the favorable market prospects (Table 2; and Annex 1, Table 3) and the attractiveness of orchard exploitation. However, there is a need for more farm storage and central cold storage in order to spread supplies over a longer period and stabilize prices. At the present time, growers with adequate storage can obtain almost twice the post-harvest price by keeping fruit for sale in the spring.

11. Fruit exports, mainly apples, pears, and peaches, are still small. They began in 1964 and have reached annual levels of about US$600,000. Export markets are the Philippines, Taiwan, and other Asian countries. Government authorities believe that there are good prospects for expanding fruit exports to these countries.

December 10, 1971

ANNEX 8
Table 1

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Fruit Demand Projection

	Apples		Grapes		Peaches		Pears	
	Trend Projection /1	Other /2	Trend Projection /1	Other /2	Trend Projection /1	Other /2	Trend Projection /1	Other /2
	('000 tons)							
1971	233	223	41	36	96	86	65	63
1972	262	237	50	38	112	89	70	66
1973	294	254	62	40	131	93	75	69
1974	333	272	75	43	153	98	82	73
1975	370	291	92	45	180	102	88	76
1976	416	312	112	48	210	107	95	80
1977	460	333	137	51	246	112	103	84
1978	514	356	167	54	288	116	111	88
1979	576	381	203	57	336	121	119	93
1980	645	408	248	61	394	127	129	97
1981	722	437	303	64	461	133	140	103
1982	809	468	370	68	540	139	151	107
1983	907	499	451	72	631	145	163	113
1984	1,015	535	550	77	738	152	176	118
1985	1,138	372	671	81	863	158	190	124

/1 Trend projections for 1960-70 period: apples, 12%; grapes, 22%; peaches, 17%; pears, 8%.

/2 Projections take into account: the rate of population increase (P=1.5%), income elasticity of demand (N), rate of income increase per capita (G). P + NG. Apples, 7.0%; grapes, 6.0%; peaches, 4.5%; pears, 5.0%.

Source: Mission projections from basic data provided by Economic Planning Board (EPB).

December 10, 1971

ANNEX 8
Table 2

KOREA

AGRICULTURAL CREDIT PROJECT

1965-1970 Fruit Prices

Years	Producer Prices				Retail Prices			
	Apple	Grape	Peach	Pear	Apple	Grape	Peach	Pear
	----------W/kg----------							
1965	27.73	45.07	21.22	32.64	53.81	55.73	32.80	41.71
1966	26.77	53.07	19.47	28.96	47.63	57.33	38.13	38.03
1967	31.63	61.87	29.33	36.75	58.99	113.07	38.13	47.63
1968	39.84	54.40	25.07	41.76	67.31	78.13	46.67	66.51
1969	41.23	82.40	32.80	45.71	72.16	184.53	68.53	64.64
1970	59.47	80.80	33.33	66.13	89.92	198.13	67.47	95.04

Source: NACF Monthly Review, June 1971.

December 1, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

MODEL 1 (a): A P P L E S

7 ha with supplementary irrigation
of which 1 ha intercropped with soybean

A. ASSUMPTIONS ON PER HA YIELD, SALES, INVESTMENT AND OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

YEAR		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14-18	19	20	21-24	25	26-29	30	31	32-35
		Without Project																						
Yield																								
1 ha existing apples, m ton/ha		20	20	21	22	23	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
1 ha new apples, m ton/ha		-	-	-	-	-	1	2	6	12	18	24	28	28	28	28	28	28	28	28	28	28	28	28
Soybeans intercropped, m ton/ha		-	0.7	0.6	0.5	0.5	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		(in W'000)																						
Sales																								
Apples @ W 70/kg		1,400	1,400	1,470	1,540	1,610	1,750	1,820	2,100	2,520	2,940	3,360	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
Soybean @ W 70/kg		-	49	42	35	35	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		1,400	1,449	1,512	1,575	1,645	1,778	1,820	2,100	2,520	2,940	3,360	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
Investment & Replacement Cost	Unit Cost W																							
1. Land Improvement																								
Land preparation & roads, day a/ b/	1,000	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manuring & planting, mandays	500	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manure, ton	500	-	2	2	3	5	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fertilizer, kg	50	-	3	3	4	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides, kg	300	-	6	10	18	26	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime, kg	25	-	2	-	7	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irrigation & weeding, fuel, liter	80	-	1	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor, mandays c/	500	-	80	85	90	95	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Buildings																								
Farm storage facilities, liter	500,000	-	500	-	-	-	-	-	50	-	-	-	-	-	50	-	50	-	-	50	-	-	50	-
3. Machinery, Implements & Facilities																								
Power tiller, ½ a/	360,000	-	90	-	-	-	-	-	-	-	-	90	-	-	-	-	-	90	-	-	-	90	-	-
Power sprayer, No	140,000	-	140	-	-	-	-	-	-	-	-	140	-	-	-	-	-	140	-	-	-	140	-	-
Well & house, No	20,000	-	20	-	-	-	-	3	-	-	-	-	-	-	3	-	3	-	-	3	-	-	3	-
Motor pump, No	50,000	-	50	-	-	-	-	-	-	-	-	50	-	-	-	-	-	50	-	-	-	50	-	-
Implements & tools, set	30,000	-	3	3	3	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Planting Material																								
Planting & replanting, trees	100	-	24	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Contingencies (15%)			141	16	18	20	23	-	8	-	-	42	-	-	8	-	8	42	-	8	-	42	8	-
Sub-Total			1,078	123	139	155	178		61			322			61		61	322		61		322	61	
Operating Cost																								
1. Apples																								
Manure, ton	500	8	9	9	9	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Fertilizer, kg	50	8	9	10	10	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Pesticides, kg	300	40	40	40	40	40	40	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Lime, kg	25	-	2	-	2	-	2	-	4	-	4	-	4	-	4	-	4	-	2	-	2	2	2	2
Irrigation & weeding, fuel, liter	80	1	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Labor, mandays d/	500	100	98	108	118	128	138	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276
Implements & tools		7	3	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Packing material		80	86	89	92	96	100	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Repair & maintenance			12	12	12	12	12	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
2. Soybeans		9	8	7	6	5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total		239	267	280	295	307	322	632	636	632	636	632	636	632	636	634	634	634	634	634	634	634	634	634
Total Investment & Operating Cost		239	1,345	403	434	462	500	632	697	632	636	954	636	632	697	634	695	956	634	695	634	956	695	634
Incremental Net Value			(1,057)	(52)	(20)	22	117	27	242	727	1,143	1,245	1,843	1,847	1,782	1,845	1,784	1,523	1,845	1,784	1,845	1,523	1,784	1,845

Assumptions

a/ Land preparation, including construction of small farm roads, can be carried out by hired draft animals (5 days/ha. @ W 600/day = W 3,000/ha), or power tiller. Power tillers are also used for cultivation, intercropping, weed control and transport, and on-farm and farm-to-market. It is assumed that one in four farmers would purchase a power tiller.

b/ Provision has been made for financing of land clearing and developing 1 ha of presently uncultivated slope land.

c/ Labor used for all farm operations such as: manuring, fertilizing, liming, pest and weed control, pruning, etc.

Financial Rate of Return
(Based on 35 years project life)

Best estimate 28%

Sensitivity Test

+10% investment cost 28%
+10% operating cost 28%
-10% cost of apples 21%

B. FARMER'S LOAN CASH FLOW

(in W'000)

INFLOW																								
Loan	900	100																						
Sales	1,449	1,512	1,575	1,645	1,778	1,820	2,100	2,520	2,940	3,360	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
Total	2,349	1,612	1,575	1,645	1,778	1,820	2,100	2,520	2,940	3,360	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
OUTFLOW																								
Investment & replacements	1,078	123	139	155	178	-	61	-	-	322	-	-	61	-	61	322	-	61	-	322	61	-		
Operating cost	267	280	295	307	322	632	636	632	636	632	636	632	636	634	634	634	634	634	634	634	634	634	634	634
Debt service (interest & principal)	54	114	120	120	120	120	120	277	277	277	277	277	-	-	-	-	-	-	-	-	-	-	-	-
Total	1,399	517	554	582	620	752	817	909	913	1,231	913	909	697	634	695	956	634	695	634	956	695	634		
Surplus or (deficit)	950	1,095	1,021	1,063	1,158	1,068	1,283	1,611	2,027	2,129	2,727	2,731	2,943	3,006	2,945	2,684	3,006	2,945	3,006	2,684	2,945	3,006		
Cumulative	950	2,045	3,066	4,129	5,287	6,355	7,638	9,249	11,276	13,405	16,132	18,863	21,806	24,812	27,757	30,441	33,447	36,392	39,398	42,082	45,027	48,033		

April 19, 1972

APPENDIX 8-2

K O R E A

AGRICULTRUAL CREDIT PROJECT

MODEL I (b): G R A P E S

1.5 ha of which 1.2 ha intercropped with soybeans

A. ASSUMPTIONS ON PER HA YIELD, SALES, INVESTMENT AND OPERATING COST, AND INCREMENTAL NET PRODUCTION VALUE

YEAR		0	1	2	3	4	5	6	7	8	9	10	11-13	14	15-19	20	21	22-30
		(m tons per ha)																
Yield	Area (ha)																	
Existing vineyard m ton/ha	0.3	12	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
New vineyard m ton/ha	1.2	-	-	-	6	8	10	13	16	16	16	16	16	16	16	16	16	16
Barley m ton/ha	0.7	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweet potatoes m ton/ha	0.7	15.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soybeans	1.2	-	0.7	0.7	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-
		(W'000)																
Sales																		
Grapes at W 77/kg		277	323	370	924	1,109	1,294	1,571	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848
Barley at W 49/kg		64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweet potatoes at W 13.78/kg a/		147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soybeans at W 70/kg		-	59	59	59	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		488	382	429	983	1,109	1,294	1,571	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848
Investment & Replacement Cost																		
1. Land improvement	Unit Cost W																	
Land preparation b/	1,000		6	-														
Manuring & planting, mandays	500		6	1														
Manure, ton	500		3	5														
Fertilizer, kg	50		1	1														
Pesticides, kg	300		7	18														
Lime, kg	25		2	-														
Water, weeding, fuel, liter	80		1	1														
Labor, mandays c/	500		110	110														
2. Buildings																		
Farm storage	95,000		95	-					10					10			10	
3. Machinery, Implements & Facilities																		
Power tiller d/	360,000		90	-								90				90		
Power sprayer	140,000		140	-								140				140		
Well and house	25,000		25						3					3			3	
Motor & pump (5 HP)	50,000		50									50				50		
Supporting structure pole e/	500		18	2														
Implements & tools set	2,000		2	2														
4. Planting Material	200																	
Planting & replanting tree	200		240	24														
5. Contingencies (15%)			119	25					2			42		2		42	2	
Sub-Total			915	198					15			322		15		322	15	
Operating Cost																		
1. Grapes																		
Manure, ton	500	2	2	2	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Fertilizer, kg	50	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Pesticides, kg	300	9	9	9	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Lime, kg	25	0	1	-	3	-	3	-	3	-	1	-	2	2	2	2	2	2
Water & weeding fuel, liter	80	0	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Labor, mandays c/	500	45	45	46	191	203	229	244	269	269	269	269	269	269	269	269	269	269
Implements, tools, poles,	2,000	1	1	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Packing material, box	75	14	17	19	48	58	67	82	96	96	96	96	96	96	96	96	96	96
Repair & maintenance		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
2. Barley	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Sweet Potatoes	-	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Soybeans	-	-	17	17	17	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total		149	100	102	329	331	369	401	438	435	438	435	437	437	437	437	437	437
Total Investment & Operating Cost		149	1,015	292	329	331	369	401	453	435	438	757	437	452	437	759	452	437
Incremental Net Value			(972)	(201)	315	439	586	831	1,056	1,074	1,071	752	1,072	1,057	1,072	750	1,057	1,072

a/ Including value of by-product from sweet potatoes.

b/ Land preparation, including construction of small farm roads, can by carried out by hired draft animals (5 days/ha @ W 600/day = W 3,000 ha); or power tiller. Power tillers are also used for cultivations, intercropping, weed control and transport on-farm and farm-to-market. It is assumed that one in four farmers would purchase a power tiller. Provisions has been made for financing of land clearing and developing 1 ha of presently uncultivated slope land.

c/ Labor used for all farms operations such as manuring, fertilizing, liming, weed control, harvesting etc.

d/ Supporting structure consist of concrete posts, bamboo canes and wires at W 500 each.

Financial Rate of Return
Based on 25 years project life)

Best estimate 40%

Sensitivity Tests

+ 10% investment cost 38%
+ 10% operating cost 38%
- 10% price of grapes 33%

B. FARMER'S LOAN CASH FLOW

	(in W'000)																
INFLOW																	
Loan	750	150															
Sales	382	429	983	1,109	1,294	1,571	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848
Total	1,132	579	983	1,109	1,294	1,571	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848	1,848
OUTFLOW																	
Investment & replacements	915	189	-	-	-	-	15	-	-	322	-	15	-	322	15	-	
Operating cost	100	102	329	331	369	401	438	435	438	435	437	437	437	437	437	437	
Debt service (interest & principal)	45	99	108	108	219	219	219	219	219	219	-	-	-	-	-	-	
Total	1,060	390	437	439	588	620	672	654	657	976	437	452	437	759	452	437	
Surplus or (deficit)	72	189	546	670	706	951	1,176	1,194	1,191	872	1,411	1,396	1,411	1,089	1,396	1,411	
Cumulative	72	261	807	1,477	2,183	3,134	4,310	5,504	6,695	7,567	11,800	13,196	20,251	21,340	22,736	35,435	

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KOREA

AGRICULTURAL CREDIT PROJECT

MODEL 1 (c): PEACHES AND OTHER STONE FRUIT

2 ha peaches of which 1 ha initially intercropped with soybean

A. ASSUMPTIONS ON PER HA YIELD, SALES, INVESTMENT COST, AND INCREMENTAL NET PRODUCTION VALUE

YEAR		0	1	2	3	4	5	6	7	8	9	10	11-20	21	22	23	24	25
		Without Project																
		(m tons per ha)																
Area & Yield																		
0.5 ha existing peaches, m ton/ha		10	11	12	13	14	15	15	15	15	15	15	15	-	-	-	-	-
1.5 ha new peaches, m ton/ha		-	-	-	-	6	8	10	12	14	16	18	18	17	16	15	14	13
.5 ha barley		1.3																
.5 ha sweet potatoes, second crop, m ton/ha		10.7																
1.2 ha soybean, intercropped, m ton/ha		-	0.7	0.6	0.5	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-
		(in W'000)																
Sales																		
Peaches @ W 34/kg		170	187	204	221	544	663	765	867	969	1,071	1,173	1,173	867	816	765	714	663
Twigs @ W 200/bundle		4	4	6	8	10	14	18	18	18	18	18	18	18	14	14	14	14
Barley @ W 13.5/kg		144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soybeans @ W 70/kg		-	74	63	53	42	42	-	-	-	-	-	-	-	-	-	-	-
Total		318	265	273	282	596	719	783	885	987	1,089	1,191	1,191	885	830	779	728	677
Investment & Replacement Cost	Unit Cost W																	
1. Land Improvement																		
Land clearing & preparation a/ b/	1,000		5															
Manuring & planting, mandays	500		8	2	2													
Manure, ton	500		4	6	8													
Fertilizer, kg	50		1	2	4													
Pesticides, kg	300		9	23	36													
Lime, kg	25		3	-	3													
Water for spraying, fuel, liters	80		2	2	2													
Labor, mandays c/	500		65	42	54													
2 Building																		
Packing shed & farm store	50,000		50									40		-				
3 Machinery, Implements & Facilities																		
Power tiller, 1	360,000		90									81		81				
Power sprayer	140,000		140									126		126				
Well @ W 25,000, pumps @ W 9,000	32,000		32									6		6				
Motor	30,000		30									27		27				
Implements & tools, set	2,000		2	1	1													
4. Planting Materials																		
Saplings, 480 saplings	80		58	6	-													
5. Contingencies (15%)			75	8	10													
Sub-Total			574	92	120							280		240				
Operating Cost																		
1 Peaches																		
Manure, ton	500	3	3	3	3	10	10	10	10	10	10	10	10	7	7	7	7	7
Fertilizer, kg	50	1	1	1	1	5	5	5	5	5	5	5	5	4	4	4	4	4
Pesticide, kg	300	15	15	15	15	60	60	60	60	60	60	60	60	45	45	45	45	45
Lime, kg	25	1	-	1	-	1	2	2	2	2	2	2	2	2	2	2	2	1
Water & spraying, fuel, liters	80	-	-	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Labor, mandays c/	500	23	23	23	23	92	92	92	92	92	92	92	92	69	69	69	69	69
Implements & tools, set	2,000	1	1	1	1	4	4	4	4	4	4	4	4	3	3	3	3	3
Packing materials, boxes	75	10	11	12	13	32	39	46	52	58	64	64	64	49	49	48	48	47
2 Barley		16																
3 Sweet Potatoes		28																
4 Soybeans		-	15	13	11	9	9											
5 Repair & Maintenance		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Sub-Total		107	78	79	77	224	232	230	236	242	248	248	248	190	190	189	189	187
Total Cost		107	652	171	197	224	232	230	236	242	248	528	248	430	190	189	189	187
Net Production Value		211	(387)	102	85	372	487	553	649	745	841	663	943	455	640	590	539	490
Net Incremental Value		-	(598)	(109)	(126)	161	276	342	438	534	630	452	732	244	429	379	328	279

Assumptions

a/ Provision has been made for financing of land clearing and developing 1 ha of presently uncultivated slope land.

b/ Land preparation, including construction of small farm roads, can be carried out by hired draft animals (5 days per ha, at W 600 per day = W 3,000 per ha) or power tiller. Power tillers are also used for cultivations, intercropping, weed control and transport, on-farm and farm-to-market. It is assumed that one in four farmers would purchase a power tiller.

c/ Labor used for all farm operations such as manuring, fertilizing, liming, pest and weed control.

Financial Rate of Return:
(Based on 25 years project life)

Best estimate 30%

Sensitivity Tests

+10% investment cost 28%
+10% operating cost 28%
-10% price of peaches 25%

B. FARMER'S CASH LOAN FLOW

(in W'000)

INFLOW																	
Loan	460	80															
Sales	265	273	282	596	719	783	885	987	1,089	1,191	1,191	885	830	779	728	677	
Total	725	353	282	596	719	783	885	987	1,089	1,191	1,191	885	830	779	728	677	
OUTFLOW																	
Investment & replacements	574	92	120	-	-	-	-	-	-	280	-	240	-	-	-	-	
Operating cost	78	79	77	224	232	230	236	242	248	248	248	190	190	189	189	187	
Debt service (interest & principal)	28	60	65	65	178	178	178	178	-	-	-	-	-	-	-	-	
Total	680	231	262	289	410	408	414	420	248	528	248	430	190	189	189	187	
Surplus or (deficit)	45	163	20	307	309	375	471	567	841	663	943	455	640	590	539	490	
Cumulative	45	208	228	535	844	1,219	1,690	2,257	3,098	3,761	13,291	13,646	14,286	14,876	15,415	15,905	

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KOREA

AGRICULTURAL CREDIT PROJECT

MODEL 1(d): P E A R S 2 hectares

APPENDIX 8-4

A. ASSUMPTIONS ON PER HA YIELD, SALES, INVESTMENT AND OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14-18	19	20	21-24	25	26-29	30	31	32-35
Yield		Without Project																						
1 ha existing pears, m ton/ha		20	20	21	22	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
1 ha new pears, m ton/ha		-	-	-	-	-	1	2	5	10	15	20	25	25	25	25	25	25	25	25	25	25	25	25
Soybeans intercropped, m ton/ha		-	0.7	0.6	0.5	0.5	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		(in W'000)																						
Sales																								
Pears at W 65/kg		1,300	1,300	1,365	1,430	1,495	1,560	1,625	1,820	2,145	2,470	2,795	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120
Soybeans at W 70/kg		-	49	42	35	35	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		1,300	1,349	1,407	1,465	1,530	1,588	1,625	1,820	2,145	2,470	2,795	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120
Investment & Replacement Cost	Unit Cost W																							
1. Land Improvement																								
Land preparation, roads, weeding, fuel litter a/ b/	80	-	6	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manuring & planting, manday	500	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manure, ton	500	-	2	2	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fertilizer, kg	50	-	2	2	3	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides, kg	300	-	5	8	12	16	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime, kg	25	-	2	0	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor, mandays c/	500	-	70	75	80	85	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Buildings																								
Farm storage facilities, No	400,000	-	400	-	-	-	-	-	40	-	-	-	-	-	40	-	40	-	-	40	-	-	40	-
3. Machinery, Implements & Facilities																								
Power tiller, ½ a/	360,000	-	90	-	-	-	-	-	-	-	-	-	90	-	-	-	-	90	-	-	-	90	-	-
Power sprayer, No	140,000	-	140	-	-	-	-	-	-	-	-	-	140	-	-	-	-	140	-	-	-	140	-	-
Well & house, No	20,000	-	20	-	-	-	-	-	2	-	-	-	-	-	2	-	2	-	-	2	-	-	2	-
Motor pump, No.	35,000	-	35	-	-	-	-	-	-	-	-	-	40	-	-	-	-	40	-	-	-	40	-	-
Implements & tools, set	2,000	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Planting Material																								
Planting & replanting, trees	100	-	24	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Contingencies (15%)			121	14	15	17	19	-	6	-	-	-	41	-	6	-	6	41	-	6	-	41	6	-
Sub-Total			929	107	117	128	144		48				311		48		48	311		48		311	48	
Operating Cost																								
1. Pears																								
Manure, ton	500	5	6	6	6	7	7	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Fertilizer, kg	50	5	6	6	6	6	6	14	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Pesticides, kg	300	18	19	19	19	20	20	40	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Lime, kg	25	0	2	0	2	0	2	0	4	0	4	0	4	0	4	2	2	2	2	2	2	2	2	2
Cultivation & weeding, fuel, liter	80	0	1	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Labor, mandays c/	500	70	75	80	85	90	90	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Implements & tools		2	3	4	4	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Packing material		70	70	75	80	85	85	170	170	170	170	170	180	180	180	180	180	180	180	180	180	180	180	180
Repair & maintenance		10	10	10	10	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
2. Soybeans		-	8	7	6	5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total		180	200	209	220	229	230	450	458	456	460	456	470	466	470	468	468	468	468	468	468	468	468	468
Total Investment & Operating Cost		180	1,129	316	337	357	374	450	506	456	460	456	781	466	518	468	516	779	468	516	468	779	516	468
Incremental Net Value			(900)	(29)	8	53	94	55	194	569	890	1,219	1,219	1,534	1,682	1,532	1,484	1,221	1,532	1,484	1,532	1,221	1,484	1,532

Financial Rate of Return
(Based on 35 years project life)

Best estimate 29%

Sensitivity Tests

+10% investment cost 28%
+10% operating cost 28%
-10% pears price 21%

Assumptions

a/ Land preparation, including construction of small roads, can be carried out by hired draft animals (5 days/ha at W 600/day = W 3,000) or power tiller. Power tillers are also used for cultivation, intercropping, weed control and transport on farm and farm-to-market. It is assumed that one in four farmers would purchase a power tiller.

b/ Provision has been made for financing of land clearing and developing 1 ha of presently uncultivated slope land.

c/ Labor used for all farm operations such as manuring, fertilizing, liming, pest and weed control, pruning, etc.

B. FARMER'S LOAN CASH FLOW

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14-18	19	20	21-24	25	26-29	30	31	32-35
	(in W'000)																						
INFLOW																							
Loan		750	90																				
Sales		1,349	1,407	1,465	1,530	1,588	1,625	1,820	2,145	2,470	2,795	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120
Total		2,099	1,497	1,465	1,530	1,588	1,625	1,820	2,145	2,470	2,795	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120	3,120
OUTFLOW																							
Investment & replacements		929	107	117	128	144	-	48	-	-	-	311	-	48	-	48	311	-	48	-	311	48	-
Operating cost for pears & soybeans		200	209	220	229	230	450	458	456	460	456	470	466	470	468	468	468	468	468	468	468	468	468
Debt service (interest & principal)		45	95	101	101	101	276	276	276	276	276	-	-	-	-	-	-	-	-	-	-	-	-
Total		1,174	411	438	458	475	551	782	732	736	732	781	466	518	468	516	779	468	516	468	779	516	468
Surplus or (deficit)		925	1,086	1,027	1,072	1,113	1,074	1,038	1,413	1,734	2,063	2,339	2,654	2,602	2,652	2,604	2,341	2,652	2,604	2,652	2,341	2,604	2,652
Cumulative		925	2,011	3,038	4,110	5,223	6,297	7,335	8,748	10,482	12,545	14,884	17,538	20,140	22,792	25,396	27,737	30,389	32,993	35,645	37,986	40,590	43,242

April 20, 1972

REPUBLIC OF KOREA

AGRICULTURAL CREDIT PROJECT

Sericulture

1. Some 3,000 years ago sericulture was introduced to Korea from China and today it ranks fourth among the world producers, after Japan, Mainland China and USSR, and first among silk-exporting countries. Production of silk involves cultivation of mulberry trees and raising of silk worms. About 100,000 ha of mulberry trees and 500,000 farm households are currently engaged in this activity, producing annually approximately 20,000 tons of cocoons, valued at about W 8 billion and generating exports of about US$30 million worth of raw silk. Cocoon production in 1969 was about four times higher than in 1962 and present export earnings represent about 20% of total agricultural exports. Results achieved during the First and Second Five-Year Plan periods are summarized as follows:

Achievement of First Five-Year Development Plan (1962-66)

Year	Area of Mulberry ('000 ha)	Cocoon Production (m tons)	Cocoon Yield (kg/ha)	Amount of Raw Silk Exported (m tons)	Foreign Currency Earned (US$'000)
1962	27	5,800	215	383	4,966
1966	62	9,600	155	840	13,500
	Achievement of Second Five-Year Development Plan (1967-71)				
1967	69	10,900	158	960	17,800
1969	99	20,700	209	1,730	30,200

2. Sericulturists are scattered over the valleys of the country but the industry is concentrated mainly where there is a large supply of cheap labor, mostly women, old persons and children. An important development of about 3,000 ha, is progressing well under the auspices of the Honam Silk Industry Company, which is financed by IFC through the Agriculture and Fishery Development Corporation (AFDC).

Production Methods

3. Mulberry Trees (Morus Alba). Two-year improved mulberry tree seedlings, produced by Government and more than 900 private nurseries, are used to plant fields from which leaves are harvested to feed silkworms. Mulberry trees produce economically from the third through the 15th year. Average yields and carrying capacity are:

	Years				
	2	3 to 5	6 to 10	11 to 12	13 to 15
Leaves, kg/ha/year	7,000	12,000	15,000	12,000	7,000
Carrying Capacity, '000 eggs/ha	230	400	500	400	230
Cocoon, '000 eggs/kg	1.40	1.45	1.50	1.50	1.50
Cocoon, kg/ha	320	580	750	600	320
Raw Silk, kg/ha	50	85	110	90	50

4. Silkworms (Bombyx Mori). Ten-gram boxes, each containing about 20,000 eggs produced by about 60 companies, are put to hatch in heated sheds protected from non-desirable environmental factors. Fresh mulberry leaves are collected in spring and autumn, several times per day, to feed the voracious silkworms. During these two rearing and cocoon production seasons, a large individual enterprise may hatch about half a billion eggs per season and produce about 750 kg of cocoon per year, or the equivalent of 100 kg of raw silk. On the average, an individual enterprise hatches about 50,000 eggs each per season. Cocoons are harvested in spring and autumn and sold to some 50 silk reeling companies.

Institutional Support

5. Both Government and private sector associations support the sericulture industry. Government conducts research at the Suwan sericulture experiment station and is responsible for quality control of mulberry tree saplings, silk worm eggs, cocoon grading and silk conditioning and testing. NACF operates a nationwide network of cocoon collection stations and extends credit to cocoon processors (reeling factories). Farmers, mulberry tree nurseries, silk worm egg producers, silk reeling factories and silk exporters receive technical and other trade-related backstopping from their respective associations.

Marketing

6. Cocoon marketing is regulated by Government. Except for about one-tenth of the total output, which is retained by producers for hand reeling, the production is purchased by NACF, the only authorized buyer of cocoons. The crop is then resold to licensed silk reeling factories 1/ according to allocations made by the Ministry of Agriculture and Forestry (MAF) and the Provincial governments. All silk reeling mills are owned by Korean companies, the largest of which, Hongu Raw Silk Co. Ltd., handles about one-third of the national crop and operates about 15 mills.

7. In 1970, Korea had 48 operating filatures, employing about 12,000 workers for 250 days per year and producing about 3,000 m tons of raw silk.

1/ New capacity can be established only by Government license. Location, number and capacity of filatures are related to mulberry area within a given province.

IFC provided US$1.7 million in 1969 to finance a filature mill to produce 250 tons of raw silk annually. It also supplied financial and technical assistance to farmers to develop mulberry plantations and build cocoon-raising facilities under the overall management of Honam Silk Industry Co. This project will reach its full capacity in 1975 and cover 3,000 ha, involving about 7,500 households.

8. Selling prices of cocoons to NACF are fixed annually by the Government Price Deliberation Committee, with price differentials between quality grades and between "spring" and "autumn" crop (Table 1). NACF receives a commission of W 10 per kg for its services. Farmers are paid cash on delivery, but NACF sells on credit to the reeling factories, and payment, with interest at 6%, falls due when the reeled silk is sold. The set prices at which the silk reeling companies procure their supplies of cocoons are related to target export prices for silk, allowing for normal costs and a fair margin of profit. If the actual export price exceeds the established target figure, 50% of the excess is paid into a silk price stabilization fund; if the price falls short of the target figure, 50% of the shortfall is subsidized out of the stabilization fund. The actual export prices refer to those of the Yokohama silk exchange. The rising trend of export prices in recent years has made it possible to maintain a comfortable balance in the stabilization fund, while granting farmers progressive increases in cocoon prices. Cocoon prices increased by 5.5% per year from 1965 to 1970, while the export price of raw silk increased by 6.5% a year, and the Yokohama prices by 9.0% at the same time.

	Export Raw Silk/Prices FOB Pusan (US$/kg)	Yokohama Prices (US$/kg)
1965	12.61	14.44
1966	14.71	17.39
1967	16.11	20.81
1968	16.89	19.02
1969	14.94	18.34
1970	17.40	22.38

9. A large part of reeling mills' output is exported through the Korean Raw Silk Exporters' Association although more and more is being exported directly by licensed silk mills, which try to establish their own brand name. About 90% of the national silk production of Korea is exported each year, placing it first among exporting countries since 1967 (Table 2). In 1970, 1,978 m tons of raw silk, representing US$34.4 million, were exported out of a total production of 3,027 m tons. Since 1965, Korean exports increased, by about 28% per year while production increased by only 22% (Table 3).

10. The pattern of world trade in silk has radically altered in recent years, because Japan, formerly the world's largest exporter, has now become a net importer. Japan produces and consumes as much raw silk as all other

countries in the world combined but, despite official efforts to stimulate sericulture, Japan's output has been stagnant at an average of 19,000 to 20,000 tons per year. Shortage of labor and rising wage levels are now expected to preclude any significant expansion in the future. The second factor that altered the world supply is that, in some high income countries, which were among the main silk producers, production was drastically curtailed, as in Italy, or completely abandoned, as in France, because of the high labor costs.

11. The world demand, after a short period of decrease because of fascination with synthetic fibers, has shown a constant increase since 1965 (Table 2), particularly in Japan where the kimono, as a formal dress, is now being worn side by side with western dresses. In Western Europe there is also an apparent tendency to use more silk in high quality and luxury fashions and it is generally expected that world consumption will continue to expand. FAO has estimated that the gradual upward trend will average 4% a year. Mainland China remains, however, the most important unknown, and its role in future trade of raw silk is open to speculation.

12. A projection of raw silk production under present conditions indicates that the incremental production due to the project would constitute, at full development, only 0.4% of the world production and probably 2% of Korean production.

	World Production		Korea Production		Project Incremental Production	Project as Percent of	
	1969	1979	1969	1979	1979 /1	World Production 1979	Korea Production 1979
	'000 tons						
Cocoons	336	497	21	85	1.8	0.4	2.0
Raw Silk	50	74	3	13	0.3		

/1 The Korean production increased at an annual rate of 22% during the last 10 years and it is assumed that it will increase by 15% during the period 1969-70, as projected by the Third Plan.

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KOREA

AGRICULTURAL CREDIT PROJECT

Cocoon Prices

	1st Grade		2nd Grade		3rd Grade		4th Grade		5th Grade		6th Grade	
	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
1965	282	260	260	239	239	217	217	195	195	174	-	-
1966	351	324	324	297	297	270	270	243	243	216	-	-
1967	363	335	335	307	307	280	280	252	252	224	-	-
1968	544	512	512	480	480	448	448	416	416	384	352	320
1969	544	518	512	485	480	453	448	421	416	388	352	324
1970	588	586	553	549	519	512	484	476	449	439	380	366
1971	747	n.a.	703	n.a.	659	n.a.	615	n.a.	571	n.a.	483	n.a.

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ANNEX 9
Table 1

ANNEX 9
Table 2

KOREA

AGRICULTURAL CREDIT PROJECT

Raw Silk Consumption Import and Export Estimates by Country

	1964	1965	1966	1967	1968
			(m tons)		
I. Consumption					
Japan	17,030	18,948	19,319	20,485	20,518
United States	2,179	1,974	1,671	1,157	1,004
Italy	1,717	1,645	2,215	2,368	2,721
India	1,569	1,333	1,547	1,710	1,782
France	699	695	720	662	650
Switzerland	295	314	343	403	307
Republic of Korea	231	262	346	631	631
Germany	213	189	188	203	225
Great Britain	195	146	139	117	174
Others	1,883	39	n.a.	n.a.	n.a.
Total	26,011	25,545	26,488	27,736	28,012/1
II. Imports					
Japan	18	307	1,138	1,742	1,225
United States	2,226	1,827	1,687	1,168	1,051
Italy	1,156	1,245	1,860	1,807	n.a.
France	680	700	771	717	707
Switzerland	344	359	435	503	364
Germany	214	191	190	207	226
Great Britain	204	194	211	192	211
Total	4,842	4,823	6,292	6,336	3,784/2
III. Exports					
Republic of Korea	556	587	808	919	1,056
Japan	2,236	1,037	527	224	566
Italy	152	434	383	558	n.a.
Bulgaria	81	100	146	144	161
Switzerland	49	45	92	100	57
France	20	11	55	49	43
United States	13	18	2	36	19
Germany	1	2	2	4	1
Total	3,108	2,234	2,015	2,034	1,903

/1 Annual increase of 3.2%.

/2 Annual increase of 9.4%.

Source: Bulletin of the International Silk Association 1969. Quoted in 1970 yearbook of Korea Raw Silk Exporters' Association.

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KOREA

Agricultural Credit Project

Cocoon and Raw Silk Production and Exports

		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
		tons										
I. PRODUCTION												
Coccons		4,445	4,896	5,513	6,162	5,842	7,767	9,600	10,903	16,615	20,747	21,409
Raw Silk		470	501	650	686	752	851	1,160	1,548	1,876	2,561	3,027
		Volume Tons Value US$'000										
II. EXPORTS												
USA	Volume	154	255	210	182	463	550	662	406	400	327	n.a.
	Value	1,315	2,888	2,460	2,511	5,015	6,839	9,690	6,472	6,400	3,100	n.a.
Japan	Volume	-	-	-	-	3	1	143	503	500	1,146	n.a.
	Value	-	-	-	-	35	8	2,100	8,111	9,040	19,000	n.a.
Europe	Volume	10	42	173	153	69	18	3	5	76	120	n.a.
	Value	84	44	2,155	2,213	776	197	50	79	1,120	1,800	n.a.
Other	Volume	-	-	-	-	24	-	-	7	80	51	n.a.
	Value	-	-	-	-	270	-	-	94	1,300	714	n.a.
Total:	Volume	164	297	383	335	560	569	808	921	1,056	1,644	1,978
	Value	1,399	2,932	4,615	4,724	6,096	7,044	11,840	14,756	17,860	24,614	34,392

Source: MAF Sericultural Section

ANNEX 9
Table 3

December 13, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

FARM MODEL 2: Sericulture

A. AREA, YIELD, SALES, INVESTMENT AND OPERATING COSTS AND INCREMENTAL NET PRODUCTION VALUE

	0	1	2	3	4	5	6	7	8-9	10	11	12	13-15
	Without Project												
Area													
Rice	0.4	0.4	0.4										
Barley	0.6	0.4	0.4										
Sweet Potatoes (second crop)	(0.6)	(0.4)	(0.4)										
Mulberry	0.2	0.4	0.4										
Total cultivated area	1.8	1.6	1.6										
Total land area	1.2	1.2	1.2										
	(Kg/ha)												
Yield													
Rice @ W 83/kg	3,130	3,130	3,130										
Straw @ W 5.35/kg	5,410	5,410	5,410										
Barley @ W 49/kg	1,850	1,850	1,850										
Sweet Potatoes @ W 13.5/kg	15,250	15,250	15,250										
Stalks @ W 0.39/kg	11,120	11,120	11,120										
Cocoons @ W 66.0/kg a/													
Existing area	450	518	540	616	696	720	720						
New area	0	0	0	476	580	720	720						
Mulberry branches bundles @ W 100	130	135	150	160	175	185	185						
Silkworms litter @ W 3.34/	3,800	4,000	4,500	4,900	4,950	5,400	5,400						
	(W'000)												
Sales													
1. Grains, vegetables & by products	292	232	232	232	232	232	232	232	232	232	232	232	232
2. Sericulture													
Cocoons	59	68	71	144	168	190	190	190	190	190	190	190	190
By products	5	6	6	12	14	15	15	15	15	15	15	15	15
Total	356	306	309	388	414	437	437	437	437	437	437	437	437
Investment Cost													
1. Buildings 10 pyongs @ W 10,000		100.0											
2. Machinery & equipment													
Silkworm bed 300 @ W 91		11.0	11.0	5.0						11.0	11.0	5.0	
Cocoon bed 5 @ W 6,300		13.0	12.0	6.0						13.0	12.0	6.0	
Other b/		20.0	6.0	5.0						20.0	6.0	5.0	
3. Land & crop development													
Mulberry saplings 1,440 @ W 5.72 c/	1.0	8.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fertilizer 570 kg @ W 19.4 d/		5.5	5.5										
Pesticides 16 kg @ W 90 d/		0.7	0.7										
Manure 4,800 @ W 0.63		1.5	1.5										
Draft animal 3 days @ 600		1.2	0.6										
Labor e/		11.3	6.6										
4. Contingencies (15%) f/		21.6	4.3	2.4									
Sub-Total	1.0	194.0	49.2	19.4	1.0	1.0	1.0	1.0	1.0	45.0	30.0	17.0	1.0
Operating Cost													
1. Grains, vegetables & by products	86.7	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3	66.3
2. Sericulture													
Silkworm eggs @ W 670/box	2.3	2.4	2.8	5.3	6.0	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Fertilizer @ W 19.4/kg c/	3.0	-	-	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Manure @ W 0.63/kg	1.1	-	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Pesticide @ W 90/kg c/	0.6	1.3	1.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Maintenance & repairs (3%)	2.5	5.7	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Hired animals @ W 600/ day	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Sub-Total g/	96.4	75.9	76.2	86.8	87.5	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9
Total	97.4	269.9	125.4	106.2	88.5	88.9	88.9	88.9	88.9	132.9	117.9	104.9	88.9
Net Production Value	258.6	36.1	183.6	281.8	325.6	348.1	348.1	348.1	348.1	304.1	319.1	332.1	348.1
Incremental Value	-	(222.5)	(75.0)	23.2	67.0	89.5	89.5	89.5	89.5	45.5	60.5	73.5	89.5

Assumptions

a/ In June 1971, the cocoon prices per kg were as follows:

	W/kg	% by Grade	Weighted Average
Grade 1	747	5	37.35
Grade 2	703	35	246.00
Grade 3	660	40	264.00
Grade 4	615	10	61.50
Grade 5	571	5	28.55
Grade 6	483	5	24.15
		100	661.55 rounded to 660

Financial Rate of Return
(Based on 15 years project life)

Best estimate: 18%

Sensitivity Tests

+10% investment cost 17%
+10% operating cost 16%
-10% cocoon price 12%

b/ Others: rearing shelf, incubator, rearing box, rearing net, leaf cutter, thermometers and hygrometers, floss collector, etc.

c/ Net of subsidy of 32%.

d/ Net of subsidy of 30%.

e/

1st year	2nd year
12 mendays @ W 650	8 mendays @ W 650
10 womendays @ W 350	4 womendays @ W 350

f/ The contingencies include the cost of 1/20 of power tiller as it is assumed that one in 20 farmers would buy a power tiller.

g/ The labor supplied for sericulture is unpaid family labor of 180 mendays of which 60 mendays are incremental; the 2/3 of the labor required is provided by women.

B. FARMER'S LOAN CASH FLOW

YEAR.....	1	2	3	4	5	6	7	8	9	10	11	12	13-15
	(in W'000)												
INFLOW													
Loan	160.0	40.0											
Production value	306.0	309.0	388.0	414.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0
Total	466.0	349.0	388.0	414.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0	437.0
OUTFLOW													
Investment & replacements	194.0	49.2	19.4	1.0	1.0	1.0	1.0	1.0	1.0	45.0	30.0	17.0	1.0
Operating cost	75.9	76.2	86.8	87.5	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9
Debt service (interest & principal)	9.6	21.6	24.0	55.5	55.5	55.5	55.5	55.5	-	-	-	-	-
Total	279.5	147.0	130.2	144.0	144.4	144.4	144.4	144.4	88.9	132.9	117.9	104.9	88.9
Surplus or (deficit)	186.5	202.0	257.8	270.0	292.6	292.6	292.6	292.6	348.1	304.1	319.1	332.1	348.1
Cumulative	186.5	388.5	646.3	916.3	1,208.9	1,501.5	1,794.1	2,086.7	2,434.8	2,738.9	3,058.0	3,390.1	4,434.4

KOREA

AGRICULTURAL CREDIT PROJECT

Mushrooms

Production

1. Mushroom production is in two main categories: wild mushrooms and cultivated mushrooms. Only very small quantities of wild mushrooms, which grow in various parts of the world, find their way to the markets or to the canning industry. The United States is the largest producer of cultivated mushrooms, followed by France, China (Taiwan), the United Kingdom, and the Netherlands. There are two methods of cultivation and their use varies between countries. In France, mushrooms are grown mainly in caves using both "tray" (70%) and "bed" systems; 1/ in the United States the "tray" system, often in air-conditioned housing, is used almost entirely, while in China (Taiwan), the "bed" system in simple rice sheds is the most popular.

2. During the 1960's, production increased steadily in the major producing countries (Table 1) but in varying degrees. In the EEC, France more than doubled output, reaching 64,000 m tons; the Netherlands increased its output by 10 times to 26,000 m tons. The drastic increase in production in the EEC was spurred by a large rise in consumer demand for mushrooms, especially in Germany (F.R.G.). United Kingdom production increased steadily and the United States, the largest producer, almost doubled output from 49,000 m tons in 1960/61 to about 94,000 metric tons in 1970/71. However, the most significant development has been the upsurge of cultivated mushroom production in China (Taiwan). Aided by good growing conditions, production skills, and acceptance of the canned produce in export markets, output rose from nil in the early 1960's to over 56,000 m tons in 1970/71.

3. Production in the Republic of Korea began in 1964/65, and recently the Government has begun assisting cultivators in expanding production and setting up modern processing facilities for the "champignon" type, grown for canning. Production, which in 1969/70 reached a total of 6,000 m tons, had grown as follows:

1/ The "tray" system involves moving the trays holding the growing compost from one controlled environment to another during the early growth of the mushrooms. This system allows as many as five crops a year as compared to only three with the "bed" system, which, however, is much cheaper. The "tray" system is mechanized and eliminates a number of hand-labor operations essential to the conventional "bed" system.

Year	Growing Area ('000 m^2)	Yields (kg/m^2)	Production (tons)
1965	110	1.0	106
1966	692	2.0	1,367
1967	988	1.8	1,732
1968	657	4.0	2,605
1969	505	8.4	4,224
1970	709	8.4	5,958

4. In Korea, mushrooms are produced all over the country. Cultivation houses are grouped in batteries, each battery composed of 20 to 22 houses; each house, on average, contains about two-thirds of one ha (2,000 pyong) of cultivated beds arranged in levels. Production is both capital (US$15/$m^2$) and labor (about 2 man-days/m2) intensive. More efficient methods of production, developed by the Institute of Plant Environment of ORD (founded in 1967), have enabled the industry to increase yields and reduce the area cultivated. From 1967 to date, yields increased about four times, area was reduced by half, and production increased about 2-1/2 times. At the same time, opportunities have by no means been exhausted for improving production techniques and management. Research could play an important role in helping to cut investments by improving methods of controlling humidity, temperature and pollution, etc., and, to a lesser extent, by improving growing methods--mushrooms are sensitive to nutrient levels, moisture, phytosanitary conditions.

Imports and Exports

5. Mushrooms are traded internationally mainly in the form of canned products. The volume of canned mushrooms entering the main importing countries, representing over 90% of world imports, is summarized in Table 2. Germany (F.R.G.) is the leading world importer of canned mushrooms, followed by the United States and, a distant third, Canada. Total imports 1/ increased at a fantastic rate, from 4,000 m tons in 1960 to about 52,000 m tons in 1970.

6. The remarkable increase in canned mushroom imports into Germany (F.R.G.) was stimulated by the elimination of quotas in 1959. China (Taiwan) benefited most, and by 1963 had gained a market share of almost 80%, through sales at prices of up to a third below competitors (Table 3). This price advantage has since levelled off and Taiwan's share of the German market has fallen, although total shipments have increased and imports

1/ In Tables 2, 4 and 5 quantities are expressed in terms of drained weight, i.e., the net weight of the mushrooms in the can. Gross weight includes the weight of the cartons, tin can and the brine in which the mushrooms are kept inside the can. EEC countries and Canada record imports of canned mushrooms in gross weight equivalent while the United States records them in drained weight equivalent.

from other EEC countries have taken the spotlight. A Common External Tariff for canned mushrooms was established in 1960, amounting to 23% ad valorem, and there has been a continuous reduction since then of duties on intra-EEC trade.

7. The United States is the second largest importer of canned mushrooms in the world. Until the early 1960's, France was the major supplier, but quantities were small (Table 4). U.S. imports then began to grow rapidly, mostly due to imports from Taiwan, which, by 1970, supplied almost 90% of the total. The Republic of Korea supplied 292 m tons in 1969. Canned mushroom imports are charged a specific duty of 3.2 cents per pound (drained weight) plus 10% ad valorem, the total charge averaging 15.3% in 1970.

8. Export data are shown in Table 5. China (Taiwan), the Netherlands, and France commanded over 90% of the world trade. Major destinations were Germany (F.R.G.) (55%), U.S.A. (24%), and Canada (6%). In 1965 Korea exported only 14 m tons (drained weight); in 1969, 1,224 m tons, and in 1970, 2,425 m tons. Germany (F.R.G.) is also the largest market for Korean products (over 60% in 1970), followed by Switzerland and the United States.

Prices

9. Export prices for the Taiwan product constitute the leading world market index. Since late 1963, export sales of Chinese canned mushrooms have been made on the basis of a uniform price schedule, 1/ established yearly by the Taiwan Mushroom Packers United Export Corporation (which is also charged with export promotion). Prices increased moderately every year--excepting 1969--until 1970. In 1971, due to the strong demand on the export market, Taiwan prices were increased by about 10%. Prices for French and Dutch canned mushrooms in the German (FRG) market have followed the same trend. Republic of Korea has been selling at slightly higher prices than China (Taiwan), but the quantities involved have been minor. On the United States market, where China (Taiwan) has virtually a monopoly position, import unit values of Chinese canned mushrooms in 1969 were slightly above those of the early 1960's.

Outlook

10. Projection of future import demand of canned mushrooms for the major importing countries is hazardous. A regression analysis for 1960-71 covering the United States and Germany (FRG), clearly indicates high income elasticities of demand for mushrooms, but technical considerations--especially the rapid growth of demand in both countries, and especially in Germany where consumption per capita has increased tenfold in 12 years -- make the use of the computed coefficient unreliable for projection purposes.

1/ Until 1969, applicable only to sales outside of Europe.

11. Alternatively, for the three largest importers (Germany, the United States and Canada), it has been assumed that per capita consumption of mushrooms in 1980 will increase to 1.50 kg, 0.80 kg, and 0.90 kg respectively (Table 6). The level of 1.50 Kg for Germany (F.R.G.) has been assumed to be the saturation level at which per capita consumption of mushrooms will stabilize during the 1970's. This could be a conservative estimate, but the increased availability of other types of vegetables in canned form and of fresh vegetables throughout the year should diminish the rate of growth in mushroom consumption in Germany (F.R.G.) The levels for the United States and Canada assume an increase in line with recent trends in both countries. Table 6 shows estimates of past and future supply and consumption of mushrooms in the three main importing markets.

12. Production of mushrooms resulting from the Project will amount to 3,234 tons (fresh basis) by 1980. It is assumed that the whole production will be processed into canned mushrooms for exports. Export availability from the Project by 1980 will amount to 2,100 m tons in terms of drained weight, representing 1.7% of the estimated world import demand of canned mushrooms by that time. No difficulties are envisaged in exporting those quantities, considering the dynamic growth of the mushroom market.

13. On the price side, the large expansion of world mushroom production in recent years has not lowered export prices. Competition among suppliers is expected to increase, considering the potential for increasing yields in China (Taiwan) and the growing importance of new exporters such as the Republic of Korea 1/ and China (Mainland). There will be rapid growth of demand as well, and prices are expected to remain in the 1970's at about the same level experienced in recent years.

1/ The Mission has estimated that total Korean production by 1980 (including the Project) will amount to 15,000 m tons of fresh mushrooms (9,750 m tons, drained weight). This amount would represent 12.6% of the estimated world import demand for canned mushrooms by 1980.

KOREA

AGRICULTURAL CREDIT PROJECT

Fresh Mushrooms Production, (Commercial) by Major Countries, 1959/60-1970/71
('000 m tons)

	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71
EEC												
France	28.8	32.3	34.4	40.8	46.1	49.8	54.5	65.0	63.0	64.0	n.a.	
Netherlands	3.0	4.0	5.5	6.5	8.0	11.0	15.0	17.5	20.0	21.0	26.0	
Italy	9.1	8.5	6.5	6.2	15.9	6.3	9.9	11.3	11.0	9.2	n.a.	
Germany	5.4	5.5	5.7	5.2	6.9	9.0	13.0	15.0	17.0	18.5	20.0 1/	
Belgium/Lux.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
United Kingdom	12.2	14.2	15.2	17.3	19.3	22.4	24.4	25.4	27.4	30.5	n.a.	
United States	n.a.	49.0	52.2	57.6	59.9	59.4	69.4 1/	74.8	81.9	85.6	87.9	93.8
Canada	n.a.	n.a.	n.a.	n.a.	n.a.	8.3	8.6	8.6	9.8	10.5	10.3	
China (Taiwan)	n.a.	n.a.	n.a.	38.6	22.7	32.4	38.5	50.2	52.4	32.8	39.0	56.2
Korea, Rep.	-	-	-	-	-	0.1	1.4	1.7	2.6	3.9	6.0	

n.a. = not available.

1/ Estimated.

Source: EEC Statistical Office publications.
U.S. Department of Agriculture.
Various official sources.

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ANNEX 10
Table 1

KOREA

AGRICULTURAL CREDIT PROJECT

Canned Mushrooms: Imports in the Main Importing Countries, Drained Weight Equivalent /1
1960-1970
(m tons)

	Germany, F.R.	Other EEC countries	U.S.A.	Canada	Total
1960	2,463	400/2	1,040	97	4,000
1961	3,593	607	2,137	105	6,442
1962	7,803	518	4,620	92	13,033
1963	11,595	667	6,290	111	18,663
1964	13,651	752	4,931	468	19,802
1965	14,998	900/2	5,991	460	22,349
1966	15,870	1,076	6,352	482	23,780
1967	20,808	1,196	8,191	1,064	31,259
1968	29,125	1,283	10,291	2,271	42,970
1969	29,979	1,673	10,289	2,658	44,599
1970	36,397	1,760/2	11,253	2,500	51,910

/1 Original data are published in terms of gross weight in the EEC countries and Canada and in drained weight for the United States. For comparison purpose the data have been converted to drained weight equivalent assuming that the weight represented by the carton, tin can and the brine amounts to 35 percent of the gross weight.

/2 Partly estimated.

Source: Tables 3, 4 and national trade statistics.

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KOREA

AGRICULTURAL CREDIT PROJECT

GERMANY, F.R. - Imports of Canned Mushrooms (Gross Weight) by Country of Origin, 1961-71
Quantity and Unit Value of Imports

(Quantity: m tons; unit value: US$/kg, c.i.f.)

	Germany, F.R. Imports From:													
	China (Taiwan)		France		Netherlands		Japan		Korea, Rep.		Others		Total	
	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value
1961	1,497	0.61	3,089	0.73	97	0.87	681	0.70	-	-	164	0.64	5,528	0.69
1962	6,612	0.58	3,279	0.77	245	0.90	1,200	0.66	-	-	670	0.52	12,006	0.65
1963	14,114	0.57	2,825	0.71	271	1.51	384	0.61	-	-	245	0.52	17,839	0.61
1964	15,363	0.65	4,282	0.68	734	1.22	370	0.66	-	-	253	0.59	21,002	0.66
1965	13,979	0.91	6,556	0.85	2,074	0.95	n.a.		n.a.		464	0.84	23,074	0.90
1966	15,442	0.97	5,332	1.11	2,472	1.01	259	1.20	113	0.98	797	0.84	24,415	1.01
1967	17,605	1.00	8,993	0.95	4,085	0.94	243	1.18	380	1.02	707	0.79	32,013	0.98
1968	22,142	0.77	13,799	0.82	7,357	0.80	117	0.86	198	0.90	1,195	0.80	44,808	0.79
1969	16,918	0.80	15,102	0.91	11,525	0.89	1,033	0.63	393	0.82	1,151	0.70	46,122	0.85
1970 (Jan.-Nov.)	16,214	1.00	14,517	1.05	15,747	1.04	1,780	0.93	1,412	1.07	2,322	0.92	51,992	1.03
1971 (Jan.-April)	7,759	1.08	6,264	1.09	6,733	1.08	74	1.35	788	1.27	2,167	0.94	23,785	1.08

Source: 1961-1969: EEC Statistical Office, Foreign Trade (various issues).
1970-71 Germany, F.R., Statistiches Bundesamt, Aussenhandel, Reihe 2, November 1970 and April 1971.

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ANNEX 10
Table 3

KOREA

AGRICULTURAL CREDIT PROJECT

United States - Imports /1 of Canned Mushrooms (Drained Weight) by Country of Origin, 1956-70
Quantity and Unit Value of Imports

(Quantity: m tons; unit value: US$/kg f.o.b.)

	United States Imports From:											
	China (Taiwan)		France		Japan		Korea Rep.		Others		Total	
	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value	Quantity	Unit Value
1956	-	-	858	1.29	26	2.01	-	-	41	1.52	925	1.31
1957	-	-	859	1.44	44	1.98	-	-	36	2.15	939	1.50
1958	-	-	993	1.34	105	1.52	-	-	36	2.09	1,134	1.38
1959	-	-	818	1.29	197	1.48	-	-	38	1.86	1,054	1.34
1960	-	-	593	1.53	409	1.32	-	-	38	1.92	1,040	1.46
1961	308	1.18	880	1.49	907	1.29	-	-	41	1.74	2,137	1.36
1962	2,893	1.04	615	1.58	1,032	1.17	-	-	79	1.61	4,620	1.15
1963	5,104	1.09	485	1.58	666	1.14	-	-	36	2.18	6,290	1.14
1964	3,945	1.08	527	1.57	355	1.21	-	-	103	1.44	4,931	1.15
1965	5,248	1.11	482	1.75	160	1.54	2	...	99	1.77	5,991	1.19
1966	5,793	1.16	312	1.93	147	1.40	10	...	88	1.80	6,352	1.21
1967	7,534	1.22	274	1.86	256	1.37	26	1.25	100	2.08	8,191	1.25
1968	8,620	1.23	382	1.60	896	1.29	128	1.21	265	1.36	10,291	1.25
1969	8,507	1.20	393	1.80	750	1.28	292	1.12	347	1.45	10,289	1.23
1970	9,930	1.28	339	1.86	355	1.55	142	1.40	487	1.61	11,253	1.32

/1 Imports for consumption.

Source: U.S. Department of Agriculture - U.S. Imports of Horticultural Products, FASM-191, Rev. May 1971.
U.S. Department of Commerce - U.S. Imports, December 1970.

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ANNEX 10
Table 11

KOREA

AGRICULTURAL CREDIT PROJECT

Canned Mushrooms - Exports by Major Exporting Countries and Korea Republic, Drained Weight Equivalent/1, 1965-70

(m tons)

		1965	1966	1967	1968	1969	1970
China (Taiwan)		17,699	21,445	25,643	26,499	23,952	24,104
of which to:	EEC	(10,673)	(12,900)	(14,306)	(13,998)	(11,162)	n.a.
	U.S.A.	(5,487)	(6,539)	(7,832)	(9,310)	(8,945)	n.a.
	Canada	(592)	(501)	(1,005)	(1,867)	(1,977)	n.a.
Netherlands		1,616	1,971	3,080	4,908	7,535	12,587
of which to:	EEC	(1,517)	(1,899)	(2,944)	(4,800)	(7,461)	(12,412)
France		7,443	6,273	8,676	11,105	12,542	14,575
of which to:	EEC	(5,335)	(4,298)	(6,829)	(9,381)	(10,733)	(12,581)
Korea, Republic		14	349	420	707	1,224	2,425
Total, 4 countries		26,772	30,038	37,819	43,219	45,253	53,691

/1 Converted from gross weight equivalent (except for Korea, Republic) assuming that the weight of the carton, tin can and brine amounts to 35 percent of the gross weight.

Source: China (Taiwan) - Trade of China: Taiwan (various issues).
EEC Statistical Office, Foreign Trade.
Mission data.

November 10, 1971

ANNEX 10
Table 5

ANNEX 10
Table 6

KOREA

AGRICULTURAL CREDIT PROJECT

Supply - Utilization of Mushrooms (Fresh and Canned), Fresh Weight Equivalent, in Germany F.R., United States and Canada, Past Performance and Projections to 1980

	Production	Imports		Apparent Consumption		Production as % of consumption
		Fresh	Canned	Total	Per caput	
	(---------- m tons ----------)				(kg)	(%)
Germany F.R.						
1962-64 av.	5,933	1,550	16,870	24,353	0.42	24.4
1967-69 av.	16,833	3,590	40,077	60,500	1.01	27.8
Projected 1980	25,000	4,000	65,500	94,500	1.50	26.4
United States						
1962-64 av.	58,967	-	7,867	66,834	0.36	88.2
1967-69 av.	85,166	-	14,750	99,916	0.50	85.2
Projected 1980	160,000	-	28,200	188,200	0.80	85.0
Canada						
1964-66 av.	8,515	572	963	10,050	0.51	84.7
1967-69 av.	10,177	1,070	3,258	14,505	0.70	70.2
Projected 1980	14,500	1,000	7,300	22,800	0.90	63.6

Source: Projections - IBRD Economics Department.

November 10, 1971

KOREA

AGRICULTURAL CREDIT PROJECT

MODEL 3: MUSHROOM

A. YIELD, SALES, INVESTMENT & OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

YEAR	1	2	3	4	5	6-9	10	11-14	15
	(kg/Pyong)								
Yield									
Mushroom: Spring crop	31	33	36	38	40	40	40	40	40
Autumn crop	27	29	32	35	37	37	37	37	37
Manure	230	230	230	230	230	230	230	230	230
	(in W'000)								
Sales									
Mushroom @ W 130/kg	15,080	16,120	17,680	18,980	20,020	20,020	20,020	20,020	20,020
Manure @ W 1/kg	460	460	460	460	460	460	460	460	460
Total	15,540	16,580	18,140	19,440	20,480	20,480	20,480	20,480	20,480
Investment Cost									
1. Buildings									
Cultivation beds 2,000 pyong @ 12,000	24,000								(6,000)[d]
Buildings for compost 500 pyongs @ 6,000	3,000								(750)
2. Facilities & Equipment									
Boiler, 1 ton capacity @ 3,600,000	3,600						1,800		(900)
Water system	1,323						650		(330)
Power system	390						200		(97)
Sprayer 10 @ W 10,000	100				100		100		
Thermometer 40 @ W 100	4				4		4		
Hygrometer 40 @ W 100	4				4		4		
Two-wheel cart 10 @ W 10,000	100						100		
3. Contingencies (1%)	3,903								
Sub-Total	36,424				108		2,858		(8,077)
Operating Cost									
Spawn [a] 3 tons @ W 76,000	228	228	228	228	228	228	228	228	228
Manure 36 tons @ W 3,340	120	120	120	120	120	120	120	120	120
Fertilizer [b]	267	267	267	267	267	267	267	267	267
Pesticides	323	323	323	323	323	323	323	323	323
Straw 460 tons @ W 7,000	3,220	3,220	3,220	3,220	3,220	3,220	3,220	3,220	3,220
Fuel 554 drums @ W 1,300	720	720	720	720	720	720	720	720	720
Labor [c]	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113
Repair & maintenance	650	650	650	650	650	650	650	650	650
Other	100	100	100	100	100	100	100	100	100
Sub-Total	10,741	10,741	10,741	10,741	10,741	10,741	10,741	10,741	10,741
Total	47,165	10,741	10,741	10,741	10,849	10,741	13,599	10,741	2,664
Incremental Net Value	(31,625)	5,839	7,399	8,699	9,631	9,739	6,881	9,739	17,816

Assumptions:

a/ 0.750 kg per pyong @ W 380 per kg subsidized at 80%.

b/ Fertilizer

	Unit Price	Subsidized at
N 2,360 kg	W 65.8	5%
P 1,656 kg	W 41.96	43%
Ca 2,840 kg	W 14.93	30%

c/ Labor: 5,529 Mandays @ W 650
3,791 Womandays @ W 350
6 months specialized labor @ W 32,000

d/ Residual values.

Financial Rate of Return
(Based on 15 years project life)

Best estimate	25%
Sensitivity Test	
+ 10% investment cost	23%
+ 10% labor cost	23%
- 10% mushroom price	18%

B. FARMER'S LOAN CASH FLOW

YEAR	1	2	3	4	5	6-7	8-9	10	11-15
	(in W'000)								
INFLOW									
Loan	29,100								
Production value	15,540	16,068	17,100	18,180	20,480	20,480	20,480	20,480	20,480
Total	44,640	16,068	17,100	18,180	20,480	20,480	20,480	20,480	20,480
OUTFLOW									
Investment & replacements	36,424	-	-	-	108	-	-	2,858	-
Operating cost	10,741	10,741	10,741	10,741	10,741	10,741	10,741	10,741	10,741
Debt service (interest & principal)	3,492	3,492	3,492	8,073	8,073	8,073	-	-	-
Total	50,657	14,233	14,233	18,814	18,922	18,814	10,741	13,599	10,741
Surplus or (deficit)	(6,017)	1,827	2,867	366	1,558	1,666	9,739	6,881	9,739
Cumulative	(6,017)	(4,190)	(1,323)	(957)	601	5,599	15,338	22,219	70,914

April 20, 1972

KOREA

AGRICULTURAL CREDIT PROJECT

Poultry and Swine

1. ROK's national herd in 1969 was estimated at 1.2 million beef cattle, 19,000 dairy cows, 1.3 million hogs and 100,000 sheep and goats. Its management regime relies on utilization of wild grasses during the warm season and cereal straw, some silage and cooked food during the cold season. National flock of fowl (chicken, ducks, turkeys and geese) was estimated at 23 million.

2. Total number of farm households for livestock and poultry breeding in 1969 was estimated at about 4.2 million. The Ministry of Agriculture and Forestry (MAF) estimates that, from 1965 to 1969, the size of herds and flocks increased per farm household, while total numbers of farm households and livestock decreased (except poultry). MAF data are:

Species	Farm Households		Livestock and Poultry	
	1965	1969	1965	1969
	---W '000---			
Beef Cattle	1,157	1,025	1,315	1,206
Dairy Cows	1	2	7	19
Hogs	1,083	991	1,382	1,338
Sheep and Goats	106	56	178	101
Other Livestock	1,059	907	1,708	1,434
Chicken	1,320	1,200	11,893	22,651
Other Fowl	5	20	221	221
Total	4,731	4,201	16,704	26,960

3. The number slaughtered in inspected abattoirs and the resulting meat supplies from 1965 and 1969 are shown below:

	Cattle		Hogs	
	1965	1969	1965	1969
	'000			
Estimated Herd Size	1,315	1,206	1,083	991
Estimated Off-take	283	219	203	637
of which recorded as abattoir slaughter	280	217	202	636
	% of national herd			
Abattoir-killed Off-take	21	18	19	64
	'000 tons			
Meat Supplied from Abattoir	46	36	11	38
	Kg of meat per capita of urban population			
Meat Supplied for Urban Population	3-1/2	2-1/4	3/4	2-3/8

Marketing

4. The consumption of meat and eggs is extremely low in Korea, despite an increase in poultry of nearly 18% per year since 1965. Production not consumed on farms reaches the urban consumer through two main channels: (a) NACF's 94 livestock cooperatives, which handle about 20% of the total marketed output; and (b) private channels, which handle the remaining 80%. The livestock sub-project would involve eight provinces and 17 livestock cooperatives. The latter were selected because of: (a) the good results they achieved under NACF's current livestock development program; (b) the existence of large consumer centers in the area, such as main cities, industrial centers, armed forces camps, and such; and (c) existence also of feed mills and other livestock facilities necessary for the promotion of livestock production.

5. With other factors, the demand expressed by a high income elasticity has played an important role in the large increase of prices since 1965. The prices increased each year by 10% for poultry products and 12.7% for pork; their progression was as follows:

		1965	1966	1967	1968	1969	1970
		W					
Eggs	Unit	8.7	8.8	9.7	9.3	9.5	12.1
Broilers	kg	215	231	286	309	287	344
Pork	kg	98	87	119	172	142	178

6. The Project, which would finance 300 egg farms, 200 broiler farms, and 250 swine farms, would have a limited impact on the projected national consumption when it would have reached its full development stage. As indicated below, the projected incremental production as proportion of national consumption at the Project's full development year would be about 4% for eggs; 8% for broilers; and 0.6% for pork.

Commodities	Full Development Year	National Consumption in 1970	Projected National Consumption at Project Full Development Year	Project Incremental Production at Full Development	Project Incremental Production as % of Projected National Consumption
Eggs (million)	1977	1967	3,147	122.0	4.0
Broilers ('000 tons)	1974	40	58	4.6	8.0
Pork ('000 tons)	1974	128	161	0.9	0.6

7. These projections take into account the increase of population, the increase of income per capita and income elasticities of demand for selected commodities. Except for pork, the rates obtained by this method are much more conservative than those obtained from the 1965-80 trend projection (Table 1).

April 28, 1972

ANNEX 11
Table 1

KOREA

AGRICULTURAL CREDIT PROJECT

Meat and Egg Consumption
(Actual and Projected 1965-80)

	Eggs 1/		Broilers 1/		Pork 1/	
	Trend Projection	(D=P+NG) Projection	Trend Projection	(D=P+NG) Projection	Trend Projection	(D=P+NG) Projection
	------Million Unit------		-------'000 tons-------		-------'000 tons-------	
1965	855		17.84		124.38	
1966	1,298		21.00		131.13	
1967	1,657		25.62		116.64	
1968	1,504		38,95		125.55	
1969	2,362		33.97		120.42	
1970	1,967		39.87		127.80	
1971	2,321	2,105	47.00	44.00	128.77	135.68
1972	2,738	2,242	55.20	48.40	129.53	143.36
1973	3,232	2,400	64.88	53.20	130.30	152.32
1974	3,812	2,577	76.24	58.40	131.07	161.28
1975	4,498	2,754	89.56	64.40	131.84	170.24
1976	5,309	2,950	105.24	70.80	132.61	180.48
1977	6,265	3,147	123.68	77.60	133.37	192.00
1978	7,392	3,363	145.32	85.60	134.27	203.52
1979	8,723	3,600	170.76	94.00	134.78	215.04
1980	10,293	3,855	200.64	103.60	135.81	229.12

1/ The trend projection for each commodity is as follows:

Eggs: 18% Broilers: 17.5% Swine: 0.6%

(D=P+NG) projection takes into account the increase rate of population (P=0.015), the increase rate of income per capita (C=0.07): and income elasticity of demand for selected commodities (N=0.78 for eggs; N=1.23 for broilers; N=0.60 for swine). These coefficients are estimated by Korean Economic Planning Bureau (EPB) and show the following rate of increase in demand:

Eggs: 7% Broilers: 10% Swine: 6%

December 13, 1971

K O R E A

AGRICULTURAL CREDIT PROJECT

FARM MODEL 4 (a): Poultry - Broiler Production: Capacity 4,000 Birds

A. SALES, INVESTMENT AND OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

YEAR	1	2-5	6	7-11	12	13-15
	(in W'000)					
SALES						
Broilers @ 1.5kg/bird W 220/kg	5,016	5,016	5,016	5,016	5,016	5,016
Manure @ 1.5kg/bird W 4/kg	92	92	92	92	92	92
Total Sales	5,108	5,108	5,108	5,108	5,108	5,108
INVESTMENT COST						
1. Buildings (Unit Cost in W'000)						
Brooder house @ 20 Pyongs (15)	300					
Rearing house @ 30 " (15)	450					
Finishing house @ 40 " (15)	600					
Sub building @ 5 " (15)	75					
2. Implements & Facilities						
Chick cages	90		90		90	
Stoves	12		12		12	
Water system	41		-		-	
Waterers	21		21		21	
Feeders	72		72		72	
Tools	12		12		12	
3. Contingencies (15%)	251		-		-	
Sub-total	1,924		207		207	
OPERATING COST						
Day-old chicks [a] / W 70/chick	1,120	1,120	1,120	1,120	1,120	1,120
Feed [b] / W 44/kg	3,010	3,010	3,010	3,010	3,010	3,010
Veterinary & medicine W 6/bird	96	96	96	96	96	96
Water, power & fuel	96	96	96	96	96	96
Labor [c] /	180	180	180	180	180	180
Maintenance	43	43	43	43	43	43
Miscellaneous	32	32	32	32	32	32
Sub-total	4,577	4,577	4,577	4,577	4,577	4,577
Total Investment Operation Costs	6,501	4,577	4,784	4,577	4,784	4,577
INCREMENTAL NET VALUE	(1,393)	531	324	531	324	531

a/ Four times turn-over per year of 4,000 plus 2% additional day-old chicks; the effective mortality is assumed at 7%.

b/ 3 g of feed per 1 kg of live weight broiler

c/ Hired labor: 6 months @ W 20,000 = 120,000
Paid family labor: 6 months @ W = 60,000
W 180,000

Financial Rate or Return
(Based on 15 years project life)
Best estimate 36%
Sensitivity Tests
+ 10% investment cost 32%
+ 10% feed cost 10%
- 5% price of broilers 11%

B. FARMER'S LOAN CASH FLOW

YEAR	1	2-5	6	7	8	9-11	12	13-15
	(in W'000)							
INFLOW								
Loan	1,540							
Production value	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108
Total	6,648	5,108	5,108	5,108	5,108	5,108	5,108	5,108
OUTFLOW								
Investment & replacements	1,924	-	207	-	-	-	207	-
Operating cost	4,577	4,577	4,577	4,577	4,577	4,577	4,577	4,577
Debt service (interest & principal)	185	507	-	-	-	-	-	-
Total	6,686	5,084	4,784	4,577	4,577	4,577	4,784	4,577
Surplus or (deficit) a/	(38)	24	324	531	531	531	324	531
Cumulative	(38)	58	382	913	1,444	3,037	3,361	4,954

a/ If the farmer does not pay for labor supplied by family members and does not hire any additional laborer, his net surplus will increase by W 180,000.

April 20, 1972

KOREA

AGRICULTURAL CREDIT PROJECT

FARM MODEL, 4(b): POULTRY - Egg Production - 2,000 Laying Hens

ASSUMPTIONS FOR ONE PRODUCTION CYCLE

Inputs/Outputs

	0-6 months	7-12 months	13-18 months	19-24 months
Chick-rearing period	▨			
Egg-laying period		▨	▨	▨
Bird Inventory		(No of Birds)		
Birds: Beginning of period	2,200	2,024	1,865	1,682
Mortality a/	176	61	56	50
Culls a/	-	98	127	1,632
Birds: End of period	2,024	1,865	1,682	0
Average No. per period	2,112	1,944	1,773	1,655
Egg production:		(No of Eggs)		
7-12 months @ 100 eggs/bird	-	194,400	-	-
13-18 months @ 120 eggs/bird	-	-	212,760	-
19-24 months @ 110 eggs/bird	-	-	-	182,050

A. SALES, INVESTMENT AND OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	
		▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
	(In W'000)														
Sales															
Egg- @ W 12	2,333	4,738	4,886	4,518	4,738	4,886	4,518	4,738	4,886	4,518	4,738	4,886	4,518	4,738	4,886
Culls @ W 500	69	880	113	865	880	113	865	880	113	865	880	113	865	880	113
Manure @ 8.7 kg/year x W 4	72	96	64	98	96	64	98	96	64	98	96	64	98	96	64
Total	2,474	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063
Investment Costs															
1. Buildings	Unit Cost														
Brooder House @ 10 Pyongs	15,000	150													
Laying & rearing House @ 80 "	8,000	640													
Sub-building @ 5 "	15,000	75													
2. Facilities & Implements															
Cages for starters		60				60						60			
Cages for growers		300				300						300			
Cages for layers		352				352						352			
Water system		41				-						-			
Stoves		10				10						10			
Tools		12				12						12			
3. Contingencies (15%)		246				-						-			
Sub-Total		1,886				734						734			
Operating Costs															
Day-old chicks @ W 130	286	-	-	-	286	286	-	286	286	-	286	286	-	286	286	-
Feed b/	1,054	1,554	1,417	1,323	2,608	3,794	2,971	3,931	3,794	2,971	3,931	3,794	2,971	3,931	3,794	2,971
Veterinary & medicine	106	-	106	-	106	211	106	106	106	106	106	106	106	106	106	106
Water, power & fuel	48	48	48	48	96	96	96	96	96	96	96	96	96	96	96	96
Labor @ W 20,000/month	120	120	120	120	240	240	240	240	240	240	240	240	240	240	240	240
Maintenance	28	28	28	28	56	56	56	56	56	56	56	56	56	56	56	56
Miscellaneous @ W 20/bird	42	39	35	33	51	110	74	114	110	74	114	110	74	114	110	74
Sub-Total	1,684	1,789	1,754	1,552	3,473	4,793	3,543	4,829	4,688	3,543	4,829	4,688	3,543	4,829	4,688	3,543
Total	3,570	1,789	1,754	1,552	5,359	4,793	3,543	4,829	4,688	4,277	4,829	4,688	3,543	4,829	4,688	3,543
Net Value					(2,905)	921	1,520	652	1,026	786	652	1,026	1,520	652	1,026	1,520

a/ Assumptions on Mortality and Culling

Age in Months	Mortality	Culling
0 to 6	8%	-
7 to 12	3%	5%
13 to 18	3%	7%
19 to 24	3%	100%

b/ Assumptions of Feed Requirements and Costs

	kg		Average Number of Birds		W/kg		Cost per Period (W)
1st Month	0.5	X	2,200	X	43	=	47,300.0
2 to 3 months	3.5	X	2,112	X	37	=	273,504.0
4 to 5 months	6.3	X	2,112	X	34	=	452,390.4
6th month	3.6	X	2,112	X	37	=	281,318.4
7 to 12 months	21.6	X	1,944	X	37	=	1,553,644.8
13 to 18 months	21.6	X	1,773	X	37	=	1,416,981.6
19 to 24 months	21.6	X	1,655	X	37	=	1,322,676.0

Financial Rate of Return
(Based on 15 years project life)

Best estimate 38%

Sensitivity Tests

+ 10% investment cost 32%
+ 10% feed cost 18%
- 10% Egg Price 17%

B. FARMER'S LOAN CASH FLOW

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	(In W'000)														
INFLOW															
Loan	1,500														
Production value	2,454	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063
Total	3,954	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063
OUTFLOW															
Investment and replacements	1,886	-	-	-	-	734	-	-	-	-	-	734	-	-	-
Operating cost	3,473	4,793	3,543	4,829	4,688	3,543	4,829	4,688	3,543	4,829	4,688	3,543	4,829	4,688	3,543
Debt service (interest & principal)	180	494	494	494	494	-	-	-	-	-	-	-	-	-	-
Total	5,539	5,287	4,037	5,323	5,182	4,277	4,829	4,688	3,543	4,829	4,688	4,277	4,829	4,688	3,543
Surplus or (deficit)	(1,585)	427	1,026	158	532	786	652	1,026	1,520	652	1,026	786	652	1,026	1,520
Cumulative	(1,585)	(1,158)	(132)	26	558	1,344	1,996	3,022	4,542	5,194	6,220	7,006	7,658	8,684	10,204

ANNEX IX-2

April 20, 1972

KOREA

AGRICULTURAL CREDIT PROJECT

FARM MODEL 4(c): Swine Fattening - 50 Weaner Pigs

A. AREA, PRICE AND COST ASSUMPTIONS

		No. of Units Without Project (kg)	No. of Units With	Unit Prices (W/kg)	Gross Production Value Without Project (in W'000)	Gross Production Value With	Operation Cost Without Project (in W'000)	Operation Cost With	Net Production Value Without Project (in W'000)	Net Production Value With	Incremental Net Value of Production
Rice @ 0.6 ha	Grain	1,828	1,878	83.00	155,874	155,874	38,442	38,442	134,798	134,798	-
	Straw	3,246	3,246	5.35	17,366	17,366					
Barley @ 0.7 ha	Grain	1,295	1,295	49.00	63,455	63,455	27,356	27,356	40,031	40,031	-
	Straw	2,604	2,604	1.51	3,932	3,932					
Manure @ 875 kg/head		13,125	43,750	2.00	26,250	87,500	319,100	1,063,000	44,650	149,500	104,850
Swine @ 90 kg/head a/		1,350	4,500	250.00	337,500	1,125.000					
Detail costs for swine:											
Weaner pigs b/							124,800	416,000			
Feed: 4 kg/1 kg live weight							172,800	576,000			
Family labor c/							20,000	60,000			
Miscellaneous @ W 100/head							1,500	5,000			
Maintenance							-	6,000			
Total					604,377	1,453,127	384,898	1,128,798	219,479	324,329	104,850

Assumptions:

a/ Pigs fattened: 15 without project
50 with project

b/ Weaner pigs purchased: 52
Mortality 4%

c/ Paid family labor: 2 months for 15 pigs (without project).
6 months for 50 pigs (with project).

B. SALES, INVESTMENT & OPERATING COSTS, AND INCREMENTAL NET PRODUCTION VALUE

YEAR	Unit Cost	1	2	3	4	5-15
		(in W'000)				
Sales						
Grain		240	240	240	240	240
Swine		1,213	1,213	1,213	1,213	1,213
Total		1,453	1,453	1,453	1,453	1,453
Investment Cost						
Pigsty @ 16 Pyongs	10,000	160				
Sub-building @ 4 Pyongs	10,000	40				
Water system		41				
Tools		7				
Contingencies (15%)		37				
Sub-Total		285				
Operating Cost						
Grain		66	66	66	66	66
Swine		1,063	1,063	1,063	1,063	1,063
Sub-Total		1,129	1,129	1,129	1,129	1,129
Total		1,414	1,129	1,129	1,129	1,129
Net Income with Project		39	324	324	324	324
Net Income without Project		219	219	219	219	219
Incremental Value		(180)	105	105	105	105

Financial Rate of Return
(Based on 15 years project life)

Best Estimate	58%
Sensitivity Tests	
+10% Investment Cost	50%
+10% Feed Cost	29%
-5% Hog Price	28%
-10% Hog Price:	
with paid family labor	4%
with unpaid family labor	29%

C. FARMER'S LOAN CASH FLOW

YEAR	1	2	3	4	5	6	7	8	9	10-15
	(in W'000)									
INFLOW										
Loan	230									
Production value	1,453	1,453	1,453	1,453	1,453	1,453	1,453	1,453	1,453	1,453
Total	1,683	1,453	1,453	1,453	1,453	1,453	1,453	1,453	1,453	1,453
OUTFLOW										
Investment & replacements	285	-	-	-	-	-	-	-	-	-
Operating cost	1,129	1,129	1,129	1,129	1,129	1,129	1,129	1,129	1,129	1,129
Debt service (interest & principal)	28	76	76	76	76	-	-	-	-	-
Total	1,442	1,205	1,205	1,205	1,205	1,129	1,129	1,129	1,129	1,129
Surplus or (deficit)	241	248	248	248	248	248	248	248	248	248
Cumulative	241	489	737	985	1,233	1,481	1,729	1,977	2,225	3,713

April 20, 1972

ANNEX 12

KOREA

AGRICULTURAL CREDIT PROJECT

Estimated Schedule of Disbursements

IDA Fiscal Year and Quarter	Disbursements During Quarter Ending (in US$ million)	Cumulative Disbursements at End of Quarter (in US$ million)
1972/73:		
March 31, 1973 /1	0.30	0.30
June 30, 1973	0.50	0.80
1973/74:		
September 30, 1973	0.75	1.55
December 31, 1973	0.75	2.30
March 31, 1974	0.75	3.05
June 30, 1974	0.75	3.80
1974/75:		
September 30, 1974	1.00	4.80
December 31, 1974	1.00	5.80
March 31, 1975	1.00	6.80
June 30, 1975	1.00	7.80
1975/76:		
September 30, 1975	1.10	8.90
December 31, 1975	0.60	9.50
March 31, 1976 /2	0.50	10.00
June 30, 1976 /2	0.50	10.50

/1 Estimated date of effectiveness: September 30, 1972.

/2 Estimated date of closing: September 30, 1976.

April 28, 1972

KOREA

AGRICULTURAL CREDIT PROJECT

Economic Rate of Return

1. The economic rates of return from the project to the economy have been calculated separately for each group of farm models, as shown in the attached appendixes: (1) Fruit, (2) Sericulture, (3) Mushrooms, and (4) Poultry and Swine.

2. Domestic current prices were used for all inputs and outputs. However, various sensitivity tests, increasing the costs by 10% or decreasing the benefits by 10%, were applied. The use of current domestic prices is justified for each group of commodities as follows:

(a) Fruit, poultry and pork are mainly for domestic consumption; only small quantities of apples are currently exported. 1/ Korean domestic prices are about 50% lower than FOB Japan export prices for fruit and eggs and CIF Japan import prices for poultry, meat and pork. The use of domestic prices for these commodities in economic return calculations is therefore on the conservative side.

(b) For cocoon and mushroom, current Korean prices are slightly lower than those prevailing in other competitor countries, such as Japan and Taiwan.

3. Tax revenue consists of duties on imported goods for investment or operation. The duties are as follows:

	Value of Imported Goods as % of Investment and Operating Costs	Rate of Duty
Fruit (Appendix 13-1)	15%	35%
Sericulture (Appendix 13-2)	14%	15%
Mushroom (Appendix 13-2)	19%	40%
Poultry and Swine - Investment	18%	35%
- Feed	65%	20%

(Appendix 13-3)

1/ This was confirmed by the Trade Policies and Export Projections Division of IBRD's Economic Department.

4. Subsidies are added to costs where appropriate, viz., for saplings, spawn, fertilizer, pesticides, lime, power tillers and power sprayers (details in Farm Models 1(a), 1(b), 1(c), 1(d), 2 and 3).

5. Salvage values proportional to unexpired asset life have been included in the mushroom farm model.

6. The overall economic rate of return of the project is 37%. (Appendices 13-1, 13-2 and 13-3) 1/. The high rate of return shown in poultry and swine farm models is due to the relatively high level of tax revenue without any counterpart of subsidies from the economy and also to the attractive prices for these products in Korea. It should be noted also that, because of their nature, poultry and swine operations are very sensitive to disease and mismanagement.

December 10, 1971

1/ When weighed according to the relative share of each farm in project cost, the average financial rate of return is about 32%.

K O R E A

AGRICULTURAL CREDIT PROJECT

FARM MODELS 1(a), 1(b), 1(c), 1(d), FRUIT

Economic Rate of Return

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14-18	19	20	21	22-24	25-29	30	31	32-35
Inflow	---------- W ' 000 ----------																					
1. Incremental Sales a/																						
-- Apples	--	70	140	210	350	420	700	1,190	1,540	1,960	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240	2,240
-- Grapes	46	93	647	832	1,017	1,294	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	1,571	--	--
-- Peaches	17	36	55	380	503	609	711	813	915	917	917	711	711	711	711	711	711	590	--	--	--	--
-- Pears	--	65	130	195	260	325	520	845	1,170	1,495	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820	1,820
Sub-Total	63	264	972	1,617	2,130	2,648	3,502	4,349	5,196	5,943	6,548	6,342	6,342	6,342	6,342	6,342	6,342	6,221	5,631	5,631	4,060	4,060
2. Tax Revenue b/																						
-- Apples	53	8	9	9	10	2	2	2	2	44	2	2	2	2	2	44	2	2	2	42	2	2
-- Grapes	50	13	2	2	2	2	2	2	2	44	2	2	2	2	2	44	2	2	2	2	--	--
-- Peaches	32	5	7	3	3	3	3	3	3	39	3	3	3	3	3	3	38	2	--	--	--	--
-- Pears	53	8	9	9	10	2	2	2	2	2	42	2	2	2	2	42	2	2	2	42	2	2
	188	34	27	23	25	9	9	9	9	129	49	9	9	9	9	133	44	8	6	86	4	4
TOTAL	251	298	999	1,640	2,155	2,657	3,511	4,358	5,205	6,072	6,597	6,351	6,351	6,351	6,351	6,475	6,386	6,229	5,637	5,717	4,064	4,064
Outflow																						
1. Investment Cost																						
-- Apples	1,027	117	132	148	170	--	61	--	--	280	--	--	61	--	61	280	--	--	--	280	61	--
-- Grapes	867	178	--	--	--	--	15	--	--	280	--	--	--	--	--	280	15	--	--	--	--	--
-- Peaches	542	87	113	--	--	--	--	--	--	244	--	--	--	--	--	204	--	--	--	--	--	--
-- Pears	877	101	110	121	136	--	48	--	--	--	271	--	48	--	48	271	--	--	--	271	48	--
Sub-Total	3,313	483	355	269	306	--	124	--	--	804	271	--	109	--	109	1,035	15	--	--	551	109	--
2. Incremental Operating Cost																						
-- Apples	19	33	49	62	78	76	78	76	78	76	78	76	78	77	77	77	77	77	77	77	77	77
-- Grapes	3	5	232	251	289	321	358	355	358	355	357	357	357	357	357	357	357	357	357	--	--	
-- Peaches	3	--	--	149	157	164	170	176	182	182	182	182	182	182	182	182	124	124	--	--	--	--
-- Pears	11	21	34	44	46	44	48	47	49	47	54	52	54	53	53	53	53	53	53	53	53	53
Sub-Total	30	59	315	506	570	605	654	654	667	660	671	667	671	669	669	669	611	611	487	487	130	130
3. Subsidies c/																						
-- Apples	90	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
-- Grapes	88	--	3	--	3	--	3	--	3	--	3	3	3	3	3	3	3	3	3	3	--	--
-- Peaches	88	--	--	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	--	--	--	--
-- Pears	91	2	1	2	6	1	3	2	4	2	4	2	4	3	3	3	3	3	3	3	3	3
Sub-Total	357	5	7	8	15	7	12	8	13	8	13	11	13	12	12	12	12	12	9	9	6	6
TOTAL	3,700	547	677	783	891	612	790	662	680	1,472	955	678	793	681	790	1,716	638	623	496	1,047	245	136
Net Flow	(3,449)	(249)	322	857	1,264	2,045	2,721	3,696	4,525	4,600	5,642	5,673	5,558	5,670	5,561	4,759	5,748	5,606	5,141	4,670	3,819	3,928

a/ Because of the nature of the commodities, Korean current prices are only applicable.
b/ Taxes on investment goods (35% of imported components: Apples, 13.5%, Grapes, 15%, Peaches and Pears, 16%)
c/ Subsidies on: Power tiller, 23%; Power sprayer, 48%; fertilizer, 20%; lime, 100%.

September 22, 1971

Economic Rate of Return
Best estimate 37%
Sensitivity Test
- 10% incremental sale 34%
+ 10% investment cost 35%
+ 10% operating cost 36%

KOREA

AGRICULTURAL CREDIT PROJECT

Farm Models 2 and 3

Sericulture and Mushroom

Economic Rate of Return

	1	2	3	4	5	6	7	8-9	10	11	12	13-14	15
	W'000												
I. SERICULTURE													
Inflow													
Incremental Sales [a]	(50.0)	(47.0)	32.0	58.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
Taxes [b]	1.0	1.0							1.0	1.0			
Total	(49.0)	(46.0)	32.0	58.0	81.0	81.0	81.0	81.0	82.0	82.0	81.0	81.0	81.0
Outflow													
Investment	193.0	48.0	19.0						44.0	29.0	17.0		
Incremental Operating Cost	(20.5)	(20.2)	(9.6)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)	(8.9)
Subsidies [c]	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total	176.5	29.8	11.4	(6.9)	(6.9)	(6.9)	(6.9)	(6.9)	37.1	22.1	10.1	(6.9)	(6.9)
Net Flow	(225.5)	(75.8)	20.6	64.9	87.9	87.9	87.9	87.9	44.9	59.9	70.9	87.9	87.9

Economic Rate of Return		
Sensitivity tests	best estimate	18%
	+ 10% investment cost	16%
	+ 10% operating cost	17%
	- 10% incremental sale	16%

II. MUSHROOM													
Inflow													
Incremental sales [a]	15,540	16,060	17,100	19,180	20,480	20,480	20,480	20,480	20,480	20,480	20,480	20,480	20,480
Taxes [b]	2,768				8				217				
Total	18,308	16,060	17,100	19,180	20,488	20,480	20,480	20,480	20,697	20,480	20,480	20,480	20,480
Outflow													
Investment	33,656				100				2,641				(8,077)
Incremental Operating Cost	10,741	10,741	10,741	10,741	10,741	10 741	10,741	10,741	10,741	10,741	10,741	10,741	10,741
Subsidies [c]	209	209	209	209	209	209	209	209	209	209	209	209	209
Total	44,606	10,950	10,950	10,950	11,050	10,950	10,950	10,950	13,591	10,950	10,950	10,950	2,873
Net Flow	(26,298)	5,110	6,150	8,230	9,438	9,530	9,530	9,530	7,106	9,530	9,530	9,530	17 607

Economic Rate of Return:	best estimate	29%
Sensitivity Tests	+ 10% Investment cost	25%
	+ 10% operating cost	24%
	- 10% incremental sale	20%

Assumptions:

a/ Korean current prices are applied.

b/ Taxes on imported components of investment goods. Import duties are for sericulture 15%
mushroom 40%

c/ Subsidies on saplings, spawn, fertilizer, pesticides. See models 2 and 3.

December 13, 1971

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AGRICULTURAL CREDIT PROJECT

APPENDIX 13-3

FARM MODELS 4(a), 4(b), 4(c): Poultry & Swine

ECONOMIC RATE OF RETURN

YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	₩'000														
Inflow															
1. Incremental Sales [a]															
- Broilers	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108	5,108
- Egg layers	2,454	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063	5,481	5,714	5,063
- Swine	849	849	849	849	849	849	849	849	849	849	849	849	849	849	849
Sub-Total	8,411	11,671	11,020	11,438	11,671	11,020	11,438	11,671	11,020	11,438	11,671	11,020	11,438	11,671	11,020
2. Tax Revenue															
- Broilers [b]	498	391	391	391	391	391	391	391	391	391	391	391	391	391	391
- Egg layers	471	493	386	511	493	437	511	493	386	511	493	437	511	493	386
- Swine	69	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Sub-Total	1,038	936	829	954	936	880	954	936	829	954	936	880	954	936	829
Total	9,449	12,607	11,849	12,392	12,607	11,900	12,392	12,607	11,849	12,392	12,607	11,900	12,392	12,607	11,849
Outflow															
1. Investment Cost															
- Broilers	1,817					195						195			
- Egg layers	1,754					683						683			
- Pork	268					-						-			
Sub-Total	3,839					878						878			
2. Incremental Operating Cost															
- Broilers	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186	4,186
- Egg layers	3,134	4,300	3,157	4,318	4,195	3,157	4,318	4,195	3,157	4,318	4,195	3,157	4,318	4,195	3,157
- Swine	692	692	692	692	692	692	692	692	692	692	692	692	692	692	692
Sub-Total	8,012	9,178	8,035	9,196	9,073	8,035	9,196	9,073	8,035	9,196	9,073	8,035	9,196	9,073	8,035
Total	11,851	9,178	8,035	9,196	9,073	8,913	9,196	9,073	8,035	9,196	9,073	8,913	9,196	9,073	8,035
Net Flow	- 2,402	3,429	3,814	3,196	3,534	2,987	3,196	3,534	3,814	3,196	3,534	2,987	3,196	3,534	3,814

Economic Rate of Return

Best estimate +100%

Sensitivity Test

+15% Investment Cost	100%
+15% Operating Cost	59%
-15% Incremental Sales	47%
No Tax Revenue	74%

Assumptions

a/ Taking into account the Korean marketing tradition, and the existing storage and transportation facilities in the country, import substition for these products seems to be very unlikely. Domestic prices therefore are used.

b/ The tax revenue consists of import taxes: (a) 35% of foreign exchange components of the investment cost; and (b) 20% of foreign exchange components of the feed cost. The imported ingredients of the feed meal are fish meal and corn meal for 100% and soybean meal for 50%.

ANNEX 14

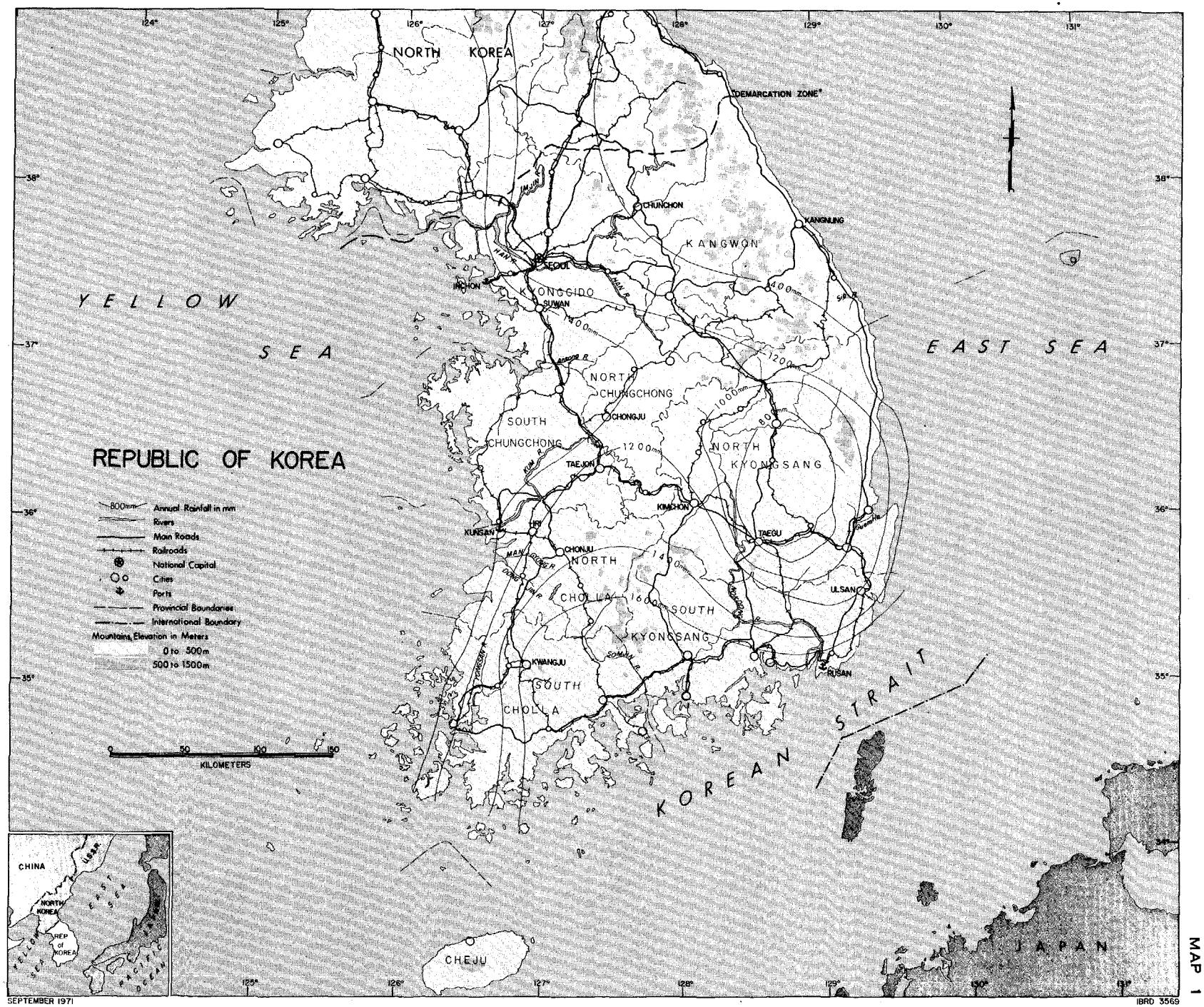
KOREA

AGRICULTURAL CREDIT PROJECT

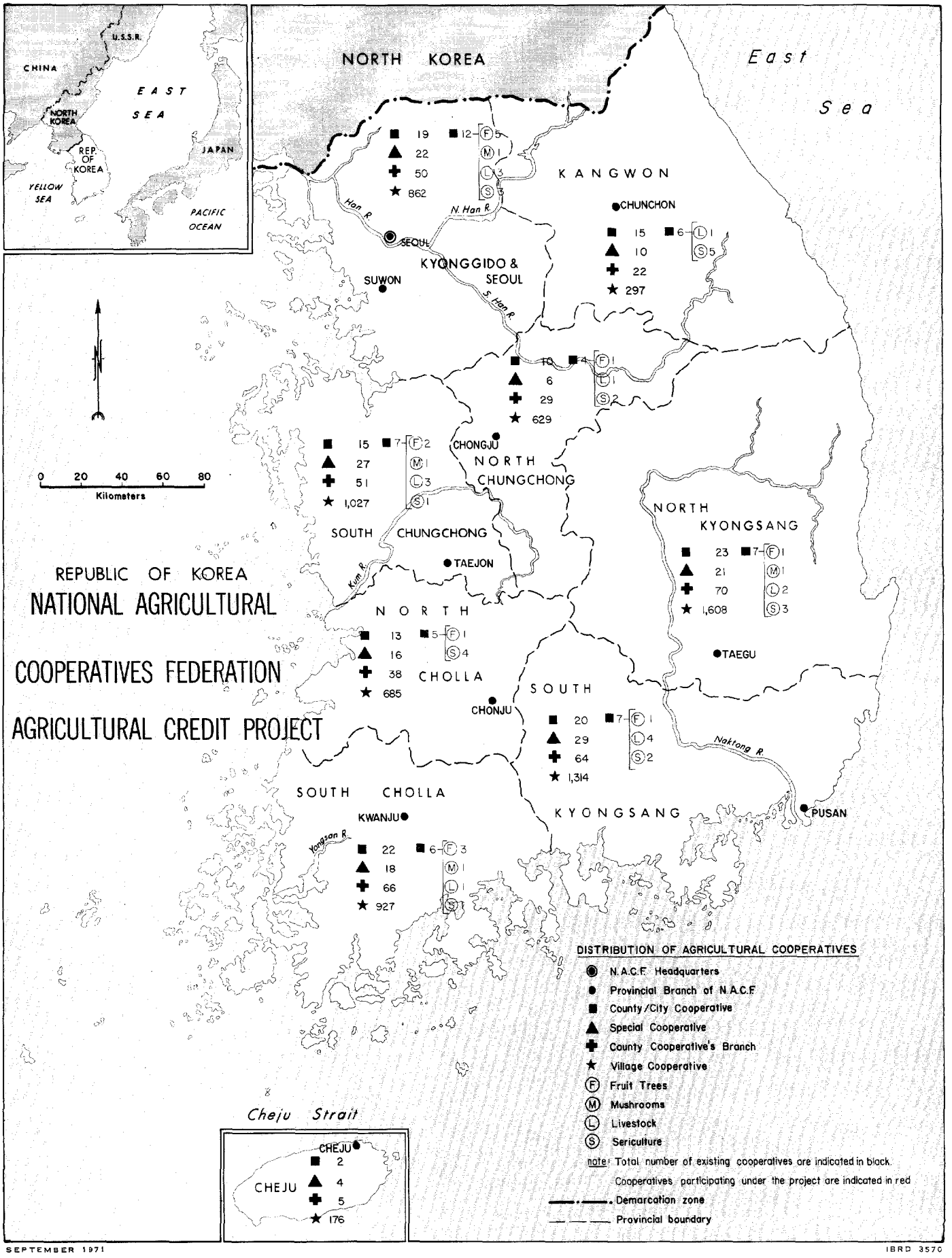
Summary: Allocation of Proceeds

	Total Project Cost	IDA Financing	
		W Million	US$ Million Equivalent
1. Fruit			
Buildings; water, heating and power systems; fertilizer, pesticides, lime and manure; planting materials; sprayers and dusters; pumps; small implements, fittings and tools for buildings; establishment costs including hired labor and animals; contingencies	2,554	1,407	3.80
2. Sericulture			
Buildings; fertilizer, pesticides, lime and manure; planting materials; small implements, fittings and tools for buildings; establishment costs including hired labor and animals; contingencies	2,187	1,230	3.32
3. Mushrooms			
Buildings; water, heating and power systems; sprayers and dusters; small implements, fittings and tools for buildings; contingencies	729	441	1.19
4. Poultry and Swine			
Buildings, water, heating and power systems; small implements, fittings and tools for buildings; contingencies	1,022	621	1.68
5. Training Facilities			
Buildings; water, heating and electric systems; small implements, fittings and tools for buildings; contingencies	111	80	0.22
6. Technical Services			
Labor and contingencies	137	106	0.29
Total	6,730	3,885	10.50

April 28, 1972


NORTH KOREA
DEMARCATION ZONE
YELLOW SEA
EAST SEA
KOREAN STRAIT
JAPAN
REPUBLIC OF KOREA
SEOUL
INCHON
SUWON
CHUNCHON
KANGNUNG
KANGWON
KYONGGIDO
NORTH CHUNGCHONG
SOUTH CHUNGCHONG
CHONGJU
TAEJON
NORTH KYONGSANG
KIMCHON
TAEGU
KUNSAN
CHONJU
NORTH CHOLLA
SOUTH KYONGSANG
ULSAN
KWANGJU
SOUTH CHOLLA
PUSAN
CHEJU
800mm Annual Rainfall in mm
Rivers
Main Roads
Railroads
National Capital
Cities
Ports
Provincial Boundaries
International Boundary
Mountains Elevation in Meters
0 to 500m
500 to 1500m
0 50 100 150
KILOMETERS
CHINA
U.S.S.R.
NORTH KOREA
REP of KOREA
EAST SEA
YELLOW SEA
PACIFIC OCEAN
SEPTEMBER 1971
IBRD 3569

MAP 1



SEPTEMBER 1971

IBRD 3570